MARCH 3, 1938

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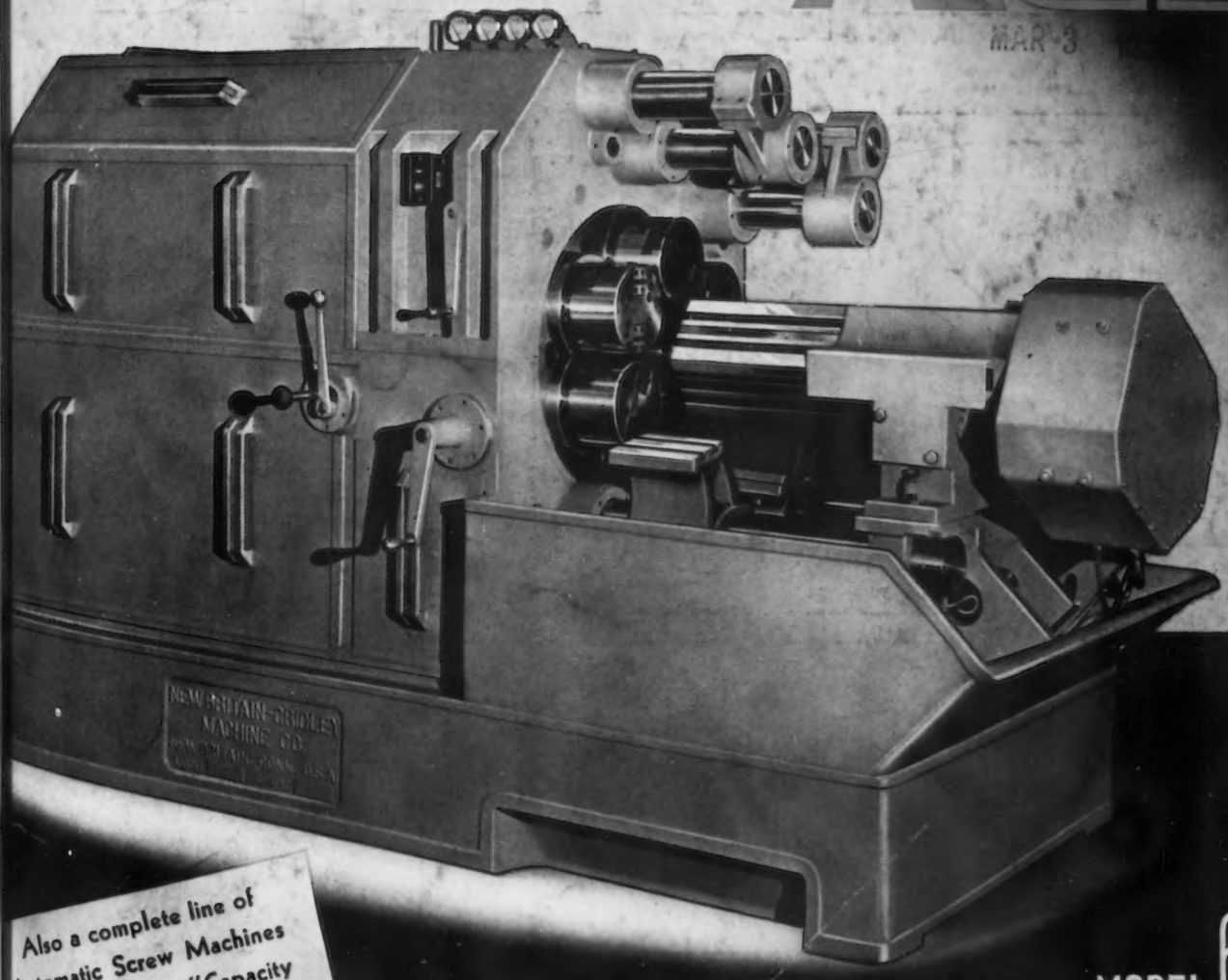

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THE IRON AGE

Contents

MARCH 3, 1938

The New Era In Steel

In 1842, when Industry's problem was availability of steel, Ryerson built up large and complete stocks.

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THE IRON AGE

MARCH 3, 1938

ESTABLISHED 1855 Vol. 141, No. 9

Industry Must Accept This Challenge

WE firmly believe, and Government statistics prove it to be so, that over the long run, technological improvement creates better paying jobs for more people. But what about the short run? What is private industry going to do to bridge the gap for the man or men who temporarily are deprived of jobs because of machine improvement?

This question is particularly important in a period of recession, such as the present. During an upturn, when demand for skilled or semi-skilled labor is greater than the supply, the problem solves itself without much help.

A young industrial engineer came to me recently with a personal problem. Said he: "My job seems to be that of getting rid of men. Getting work done with a smaller number of people. And why should it be necessary to do that when the XYZ Corp., for whom I work, has a satisfactory surplus and made a fair profit in the last quarter. Why cannot the company be content to go on as it has been doing and suspend technological improvement?"

I said to him: "Suppose that the XYZ Corp., which has been in business for 30 years, had adopted that policy in the beginning. At that time it employed some 50 men. Do you think that it would now employ 5000 men, as it does?"

Technological improvement created 4950 additional jobs in this one corporation. True enough, in the interim, perhaps 1000 men had to find other jobs, either within or outside of the company, being dislodged from their previous tasks by technological improvements. But 3950 men found working opportunity that they would not have found otherwise.

We cannot stop technological progress. But we must, if the private system of enterprise is to endure, soften the damaging effects of such progress upon the individual. And this is not a job for Government or private charity but a responsibility of management.

If we want to keep Government out of business, and most of us do, this is one of the problems that private management must solve. Particularly in times of depression when the loss of a job may be equivalent to forcing the victim to become a dependent of Government.

Let's have your views regarding the solution of this problem. Perhaps by putting our heads together we may find the answer.

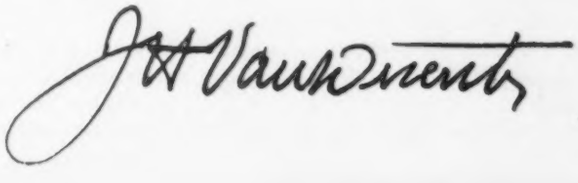


Photo courtesy of Carnegie-Illinois Steel Corp.

Natural Gas in the Open Hearth

° ° °

By RALPH VAILL

Open Hearth Combustion Co., Chicago

° ° °

NATURAL gas has been used as metallurgical fuel for 50 years or more. It has long been considered the cleanest, richest fuel obtainable in gaseous form. Yet there is not a single shop using natural gas where tonnages produced, length of furnace campaign, expenditure of B.t.u.'s per ton of steel made, or heat times, are good enough to prove the statement that natural gas is the ideal fuel. Quite the contrary. McKune, at Hamilton, Canada, has furnaces burning coke gas and blast furnace gas with a non-luminous flame which give results better than any we hear of on natural gas. A shop in the Chicago district burning the same gases with a luminous flame also puts out figures which far exceed anything on record about natural gas. Another Chicago plant has made records with producer gas that have not been duplicated with natural gas. All of this naturally causes the question to arise, *"Why are not better results obtained from the use of natural gas?"*

Before that question can be answered, it seems to be indicated that answers must be found to several more questions which the writer will raise. This one significant fact stands out—of the six types of open-hearth furnaces burning natural gas in America today, five work with a non-luminous or nearly non-luminous flame, while only one secures the full luminosity inherent in natural gas. This proportion contrasts rather oddly with the division existing between furnaces using other gaseous fuels. With other fuels, only one, the McKune furnace, is a spectacular performer on non-luminous flame; all others use a luminous flame. The predominant use of non-luminous flame natural gas furnaces is without doubt simply a tribute to the worth of natural gas and a conservative adherence to the traditions of its use. Furthermore, most open-hearth operators at heart prefer a luminous flame, and this makes the picture more puzzling. Nowadays it is known how to secure luminosity, and in the new furnaces there is no trouble in securing it.

One aspect of this problem cannot be escaped, namely, natural gas seems to work nearly as well with a non-luminous flame as it does in the new luminous flame furnaces. Therefore, with modern insulated, air-tight, scientifically controlled furnaces, there is available a fine old gas to play with, one that does what other gases won't

do so well; it produces acceptable results from both luminous and non-luminous flames. In other words, natural gas should be the fuel from which to get some real open-hearth records.

To date, the luminous-flame natural-gas furnace has not been better than the non-luminous-flame furnaces in the proportion that the theoretical superiority of radiant heat over heat by convection or conduction would lead one to expect. The luminous-flame furnace suffers under the curse of all such furnaces. It is upside down; by this the writer means the hottest part of the flame is that part of the fuel column which is in contact with the overhead air for combustion. Here in this zone the little flames that "tail" off toward the roof have a temperature of from 3300 deg. to 3500 deg. F. If these temperatures were down in the zone adjacent to the slag-metal line, more useful work would be obtained from the gas, but instead the temperature is up there damaging the roof.

On the other hand, in non-luminous-flame furnaces there is no such stratification in flame temperature. In all of them (which work well) the air and gas are premixed before entering the melting chamber, and the mixture with great turbulence and considerable velocity is forced down into direct contact with the slag and metal. The resultant flame temperature is at no time in the cycle relatively higher than the walls and roof will withstand, except with natural gas. The latter, having some luminosity inherent in it due to ethane, does, in this type of furnace, give trouble in this respect. This particular phase of the problem seems to be important in the use of natural gas, for experience has taught that in these so-called non-luminous-flame natural-gas furnaces, it is practically impossible to maintain the full heat input at certain parts of the heat cycle, for when one zone gets too hot the whole combustion chamber is too hot. It is conceivable that this is one of the factors which prevent high tonnage rates with natural gas in the non-luminous furnaces.

Luminous and Non-Luminous

Natural gas being what it is—a high powered gas with extremely high flame temperature, especially in the luminous-flame type of furnace—it seems that again the investigator is to be balked. Thus the question is brought up, "If a furnace could be operated at certain periods of the heat cycle with a luminous flame and at other periods (with less decrease than normal in heat input for the period in question) could be converted at will to a non-luminous flame furnace, retaining in either case the full benefits of the flame used, would that not be the answer to the natural gas problem?"

There are luminous natural-gas furnaces available. They are doing well, but not well enough. Briefly, this type of furnace is built quite similarly to a producer-gas furnace, in that it has two checker chambers to each end, two slag pockets, and three uptakes, one discharging into the furnace through a water-cooled port. Natural gas is admitted into this uptake at about floor level and at a low pressure in the neighborhood of 4 oz. At this point the gas encounters preheated air supplied in controlled amount to the checker chamber that is ordinarily used for passage of incoming producer gas. For a luminous flame this air would be about one-fourth to one-third of the total *air* supplied, and at moment of encounter with the *gas* would have about one inch W.G. pressure and a temperature of about 2500 deg. F. The velocity of the air and gas from the point of admission of gas to the knuckle of the furnace is probably about 120 ft. per sec., which means that in the 15 ft. of travel to the point where this partial mixture meets the overhead air, one-eighth of a second elapses.

In that one-eighth of a second, the phenomenon of cracking or breaking down of the methane (CH_4), which is 85 per cent of the gas, into hydrogen and carbon particles occurs, and a thoroughly luminous flame emerges from the gas port. It is believed that the ethane (C_2H_6), which ordinarily breaks down ahead of the methane, is an illuminant no matter how it is introduced into the furnace. Presumably the conversion of the methane into hydrogen and carbon particles is a progressive reaction, greatly influenced by the temperature and quantity of the incoming air, and as in the preheating of mixed gas, is a function of the temperature at which and the time during which the raw gas travels in a confined medium. An increase in the amount of air without decrease in its temperature, or a decrease in the time the raw gas remains in the uptake and port, would cause cracking and then partial combustion to CO_2, and would not only deliver a very hot blow torch flame, but probably would damage the port lining. An increase of air, with a decrease in temperature, and a decrease in the time period the mixture remains in the port and uptake, would result in incomplete cracking and discharge of a non-luminous flame.

NATURAL gas now is being used as an open-hearth fuel in Colorado, Mexico, Alabama, and the Pittsburgh, Ohio River, St. Louis and Chicago steel making districts. At least five distinct furnace designs are employed. The use of natural gas and the use of a certain type of luminous flame are very live issues, and for this reason the author's discussion herein as to just why certain results are (or are not) obtained is particularly timely. Particularly interesting is the author's contention that a gas furnace switching from luminous to non-luminous flame has potent possibilities.

The above presumptions or conjectures follow closely the claims made for this furnace by A. J. Boynton, who has patented the process by which natural gas is made luminous (Open Hearth Combustion Co., patent No. 1,942,682). In four widely separated sections of this country, furnaces have been constructed according to the principles of this patent. In so far as comparative performance with other natural gas furnaces is concerned, they seem to be an improvement. They have an extremely luminous flame. They give far less trouble with foaming periods during the heat cycle, and are preferred where it is desired to take extraordinary measures in "shaping the slag." However, as far as answers to the above presumptions are concerned, this type of furnace is still in the experimental stage.

Since in natural gas there is available a fuel that has given equally good results with either type of flame, since there has been proved an ability to design furnaces that will produce, each in its own way, good results from that type of flame for which it was designed but which will not work properly on other than that flame, and since it is believed that the maximum efficiency has not been obtained from natural gas by strict adherence to either principle of combustion, it seems reasonable to explore the possibilities and probabilities of a purposely designed combination furnace—one

which will incorporate the possibilities of each furnace. This seems most feasible if the luminous flame venturi furnace is used as the basic construction. In the first place, it is the only one in use that gives a 100 per cent luminous flame. In the second place, the velocity and direction of incoming gases can be controlled by venturi contours as well as by any other known furnace construction. Thirdly, by the use of two separate gas systems there results a versatility double that of the single system furnaces.

Furnace Versatility

Because of the versatility of this luminous flame furnace it is possible to look forward to better results before long in the use of natural gas, results which will come through the use of a luminous flame during periods when it serves best, and a non-luminous flame when it in turn is most useful. When melting down, a flame with high luminosity can be used, and the combustion can be governed as is wished by the conventional supply of overhead air. After the scrap becomes heated to a point where its glazed-over outer surfaces are beginning to reach an absolute temperature close to that which softens silica brick, then the luminous flame will be abandoned by sending 60 per cent of the air through the gas system, at higher pressure, and 40 per cent through the air system. This will give a blow torch flame with a short luminous core and a long non-luminous tip which will carry heat across the furnace, but will not possess the destructive inverted characteristics that at certain times in the heat cycle compel the operator to check total heat input. This non-luminous flame would be employed until after the addition of hot metal, then the furnace would be shifted back again to a luminous flame.

Possibly this method of getting a non-luminous flame will not produce just the results desired. The gas checkers may cool too rapidly, or the air checkers may become overheated. There still remain other ways of getting this non-luminous flame, and it would seem an efficient flame too. For example, an auxiliary high pressure (25 lb. per sq. in.) gas line could be placed in the gas port and made to discharge along the center line of the port. This gas would not, because of its high velocity, remain long enough in the gas port to be cracked. It would get some turbulence from the air coming in through the gas passage. And it would, because of the differential in velocities, induce rapid mixing with overhead air, and in passing through the venturi throat to the combustion chamber it would be given characteristics quite like those of the McKune furnace flame. The writer has no warrant for stating that this resultant flame, having a flame temperature of possibly 3150 deg. F., will do as much useful work as a flame with a temperature of 3450 deg. F., which would be a luminous flame, but it is believed that some work will be done in finishing the melting of the cold charge, and much useful work will be done in stepping up regenerator temperatures which have been cooled in the charging of the furnace.

After the hot metal is added, it can be assumed that a return to luminous-flame conditions will be desirable until the bath thickens with lime. At this point it is possible to enter the field of interesting conjecture. Would a blow-torch-like, highly oxidizing flame for balance of heat cycle, transferring much oxygen to the slag, be optimum? Would a soft, luminous, reducing flame be more desirable? Which would be found best for a particular plant from a metallurgical viewpoint and from that of economy? Which would give least brick expenditure?

One company has already constructed a luminous-flame furnace and has apparently placed all reliance on a luminous flame; for instead of sending air into the gas system to be preheated before mixing with the natural gas, this company is putting blast furnace gas through the gas checker chamber. This furnace should have a very luminous flame and must depend on variations in overhead air to produce oxidizing or reducing conditions in the melting chamber. However, it will most surely never be capable of producing a non-luminous flame unless a provision is made to admit the natural gas at some point nearer the point of ultimate discharge when so required. This provision would not entail a great expense. Natural gas at 15 to 25 lb. pressure is often available in the shop. A 4-in. line of this piped to the gas port bulkhead and sent into the furnace along the longitudinal center line would give a non-luminous flame, even in conjunction with preheated blast furnace gas.

The possible and feasible combinations and permutations of fuels, flames and melting conditions obtainable with this type of furnace certainly should make it an important factor in present day metallurgical fuel contemplation.

Air-Conditioning Research Under Way at Cornell

VARIOUS problems of fundamental importance to efficient air-conditioning, involving temperature, humidity, purity, and velocity, are being studied in the Sibley College of Mechanical Engineering at Cornell University. The study of "Heat Transmission from Radiators" by K. F. Rubert, recently published as Bulletin No. 24 of the Cornell University Engineering Experiment Station, is the latest of an important series that will be continued with greater frequency when the proposed heat-transfer laboratory is completed.

Radiators give off heat primarily in two ways, by direct radiation and by convection, the transfer of heat to particles circulating in the air. Since radiation accounts for between 40 and 50 per cent of the heat transmitted, any factor which decreases it lowers the efficiency of the radiator. The use of a highly reflecting paint, such as bright aluminum bronze, on the surface of a radiator, may reduce the heat output as much as 25 per cent, Rubert found. Flat paints, particularly flat black, allow a high degree of radiation. Rubert also discovered that the use of reflecting surfaces behind radiators will considerably increase the amount of heat emitted.

Correction

ON page 34 of THE IRON AGE of Jan. 20, 1938, in an article entitled "Highlights of the Year in Metal Finishing," Handy & Harman, manufacturers of precious metals of 82 Fulton Street, New York City, were reported to have developed silver solders which give high strength joints to metal parts at temperatures as low as 170 deg. F. This temperature figure was a typographical error, the correct figure being 1175 deg. F. for the lowest flow point of any brazing alloy made by the company and giving high strength.

"Without A Song"—A Sit Down?

o o o

By JOHN RICHELSEN

Personnel Director, Vanadium Corp. of America

o o o

IT would be a rash and brash prophet who would predict what labor relations in America will be like in a year from now. But whether unionization of industry continues, or unions become discredited, the absurdities of human nature will remain the same and the new era cry for baloney will not be abated.

If unionization of labor is completed there will be fierce battles within the unions, and industry, if it is smart, will have adopted such progressive labor relations policies as will then cause labor to react harmoniously and sentimentally toward their job makers.

If unionization meets defeats, industry will have been well advised to have read what follows, here, and to have governed itself accordingly. For renewed efforts to induce labor to follow after strange gods will surely have come and our proposals, if accepted, will have had great influence in neutralizing those efforts.

As a personnel director of a ferro-alloys plant, which is the next thing to a boiler factory, my enthusiasm has been aroused by several suggestions of which I have recently read, to introduce music into all our industrial workshops. If, in what follows, the reader detects a few queer notes of ecstasy in an otherwise matter-of-fact presentation, he is begged to bear

"That's where he went tremolo on us"

with it. It is hard on a watcher of the skies of labor relations to repress a hallelujah when a new star swims into his ken.

It is submitted that what this country needs is an Amendment to the Constitution, prohibiting any work to be done anywhere, by anyone, without a song. Since the morning stars first sang together and there was the music of the spheres, until now when at last medical authority and labor leadership have spoken, stiff-necked industry has resisted the introduction of sweet melodies to soothe toiling mankind. At least, some industries have. But a new morning is dawning. Only details remain to be worked out. The best procedure, and the selections of the proper songs for every job, may yet be stumping us. But let not industry trifle. Soon, now, without a song there'll be hell to pay.

Hasn't Lawrence Tibbett made it clear with his magnetic voice over the radio, that life is altogether punk "Without a Song"? And we quote the president of the American Federation of Labor, on the authority of Dr. J. R. Garner, chief surgeon of the Atlanta and West Point Railroad Co., as saying "Music is a friend of labor; it lightens the task by refreshing nerves and spirit."

An eminent medical publication recently stated that "efforts at changing or supplanting the character of sound have met with remarkable success. By means of loud speakers installed throughout many factories in Germany the rhythm of music has been used to overcome the hum of machinery. The practice is just beginning to permeate in American industry. The idea of music during working hours was in vogue in ancient Greece where special work songs were used during the performance of certain labors."

We sigh because we can see the handwriting on the wall. It's going to be up to us, personnel directors, in addition to all the wet-nursing of labor which is already our job, also to run the musical programs and select the appropriate songs for every industrial work operation.

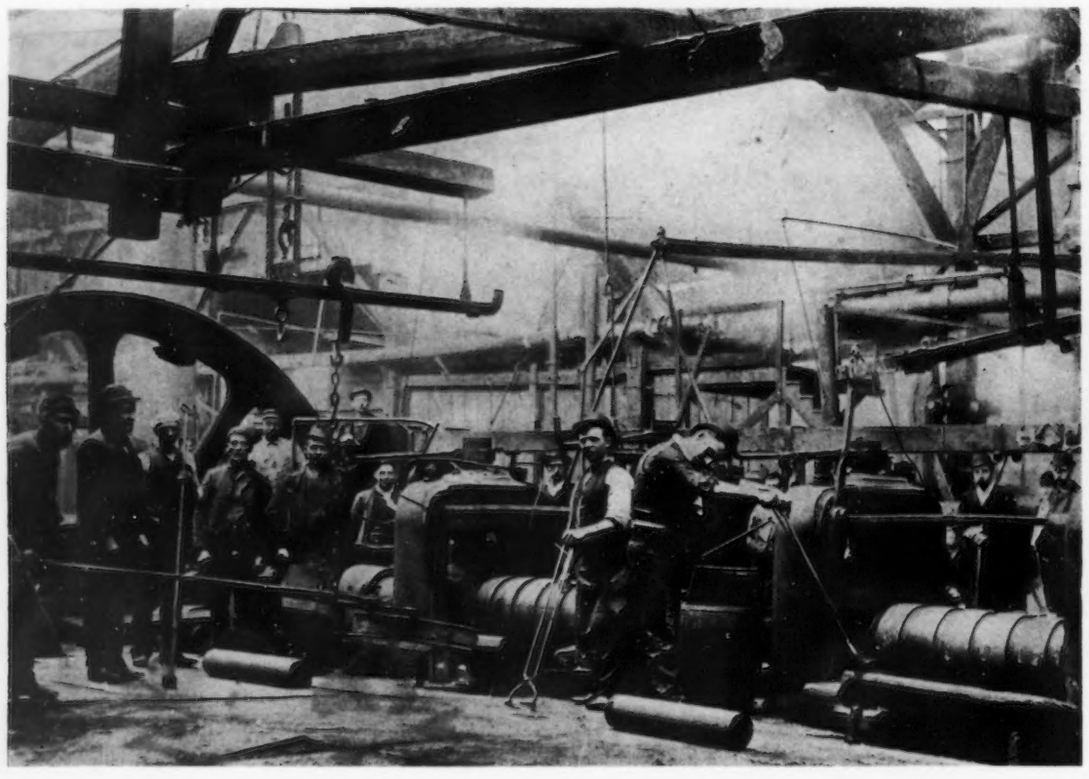
It is not our thought to berate anything which promises to ameliorate the burdens of toil. Coming to think of it, we have known before this that "Music hath charms to soothe the savage breast." But we are perplexed. How are we to adapt this innovation to the Drazdowskis and Quarentiellos? To our tappers, mixmen, castmen, and chargers? This problem is causing some of us to burn the midnight bulbs.

To create worthy and appropriate work songs for all our industries we cannot depend on tin pan alley. We shall need the help of the Mellon Business Institute and the General Electric Research Bureau. Until we can make labor happy it is folly to proceed further with our scientific snooping. Chemurgic and metallurgy must yield to the human element demands. It is ridiculous to suppose our furnace room men can sing "She Was Only A Bird In A Gilded Cage" while tapping. And if our cranemen get shouting "She May Have Seen Better Days," they are liable to smash things up in their enthusiasm. New uses call for new tunes and America's musicians are about to be challenged to save our standards of living by producing efficient industrial work songs which may be put up in handy cans.

Can capitalism conform to the current challenge? We surmise that so soon as Bruce Barton has cleared a few obsolete statutes from the legislative books, Senator Norris will be paged for the amendment to the Constitution.

Perhaps the reform won't be so bad, after all, when once it is in operation. It may be like the millennium to hear Tony, Pasquale, Mike and Manuel, at the beginning and end of each shift, holding hands, singing "America, the Beautiful!"

Let industry set its house in order. The day is close at hand when without a song there may be a sit-down!



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HALF a century's progress in steel mill mechanization and technique is forcibly visualized in this picture taken in 1892. It is the prized possession of J. J. Davis, a pensioner of the Gary Sheet & Tin Mills, now Carnegie-Illinois Steel Corp. Photographers may wonder at the unusually good lighting of this picture. It was due to the fact that the mill roof had blown off the day before the picture was taken.

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Chapter 27 of a Series on the Economics of Industrial Power Transmission Methods and Equipment.

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Application and Control of Variable Speed Transmissions

o o o

By FRANCIS JURASCHEK
Consulting Editor, The Iron Age

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THE various problems of variable speed control of industrial mechanisms may be roughly classified mechanically under three heads; (1) those having to do with the adjustment of the speed of a rotating shaft, (2) those having to do with the adjustment of speed of a reciprocating mechanism, and (3) those having to do with the adjustment of the speed of a conveyor. The first two are usually concerned with production machines; the third with the problems of bringing goods or materials to and taking them away from production machines. Again, the first two are problems revolving around the desire to improve the production of machines which make goods, to secure a better utilization factor, to secure a lower production cost, to secure a better quality of product, to meet more successfully the varying conditions in the characteristics of the materials worked upon or of external conditions affecting work upon them, or of any combination of these factors; while the third is a problem revolving around the better timing of work delivered to and taken from the production machines, to secure more perfect coordination of processes.

It will be of interest to touch very briefly upon the salient points of a few of these problems, to show in a general way the range of usefulness of variable speed transmission equipment. These illustrations are far from complete, particularly since the field of use of such equipment is being extended further every day. They will, however, indicate some of the broader problems encountered in certain industries.

Rotating Shafts

Machine tools—lathes, milling machines, boring mills, honing machines, drill presses, screw machines and grinders. To accommodate varying characteristics of the materials being worked upon, changes in depths of cut, or changes in the nature of the cutting tool or grinding wheel used.

Fans and blowers—to accommodate varying requirements of draft or suction, depending upon atmospheric conditions or changes in the nature of the work to be done.

Centrifugal and rotary pumps—to accommodate variations in the volume or pressure of the liquid as required.

Rotary cutters and slitters—to accommodate variations in size and physical characteristics of the materials handled, as well as to meet the skill of the machine attendant in handling the work.

Winding rolls—strip metal, paper, cloth and wire winding machines require automatic variable speed control to maintain constant tension as the diameters of the rolls increase or decrease.

Wire stranding and cable laying machines—to accommodate varying requirements of tensile strength in the twist or "lay" of wire rope, as well as varying characteristics of the wire itself. In the insulating of electrical wires and cables, close regulation of the speed of the machinery is necessary to secure uniform quality of product.

Chemical engineering equipment—speed regulation is of great importance in many chemically controlled industries to accommodate varying characteristics of materials, varying densities or viscosities as materials are mixed, varying atmospheric conditions and production schedules. Only a few applications may be named here as the field is extremely large. In cement and lime manufacturing and clay products work, we may mention rotary kilns and kiln feeders, concrete pipe spinning machines, mills and granulators and filter pumps; in foodstuffs manufacturing, traveling baking ovens, filling and bottling machinery, wrapping and cartoning machinery, mixers and beaters, macaroni machines, enrobing machines, can-making and soldering machines, pasteurizers and freezers; in the glass industry, glass grinding, polishing and cutting equipment; in the metal trades, metal washing, cleaning and polishing equipment; in the paper industry, macerators, cylinder and Fourdrinier machines, sectional paper machines, dryers, coaters, waxers, pasters and facers, feed rolls and spiral tube machines, and rotary printing presses; in the rubber industry, washers, shredders, mixers and rolls; in the soap industry, agitators, flakers, pulverizers, plodders and crutchers.

Miscellaneous chemical equipment will include agitators, centrifuges, drum-dryers and sewage screens.

Reciprocating Mechanisms

Machine tools—planers, slotters, shapers, broaches and die sinkers. To accommodate varying characteristics of the materials handled, changes in depths of cuts, or in character of cutting tool used.

Presses—punching, and notching presses may often be regulated to secure maximum operation consistent with the skill of the attendant. Forming and molding presses require close regulation to accommodate varying characteristics of the material and of the shaping process. Roll feed straighteners should be regulated closely to deliver coiled stock to punch presses at the best speed at which the presses can be operated; this regulation depending upon the quality and thickness of the stock as well as the temper of the material and the size and shape of the blank desired. In extrusion presses speed regulation accommodates variations in temperature and composition of the material handled.

Stokers—to accommodate varying firing demands on the furnace and varying calorific values of the fuel, to maintain uniform steam pressure even when steam use demands fluctuate. (Likewise applies to chain grate or conveyor type stokers and powdered coal screw type feeders.)

Chemical engineering equipment—in the cement, lime and clay products industries, brick-molding machines, dry presses and represses; in the foodstuffs industries, bread-slicing machines, bottle capping and labeling machines, candy molding and cutting machines, vegetable graders and washers; in the paper industry, slotters, creasers, folders, paper bag machines, stayers, envelope machines, flat bed presses, paper ruling machines. Miscellaneous; filter presses.

Conveyors

Speed regulation of conveyors is essentially concerned with the process of coordination of handling materials to and from production equipment, but may also involve variations in the treatment of materials when the conveyor is part of the production process itself, as in heat treatment work. A few types of conveyors only are here named.

Automotive — assembly and sub-assembly lines. Foundry mold conveyors. Straight-line machining through a number of machine tools.

Power plant—coal delivery and ash removal conveyors.

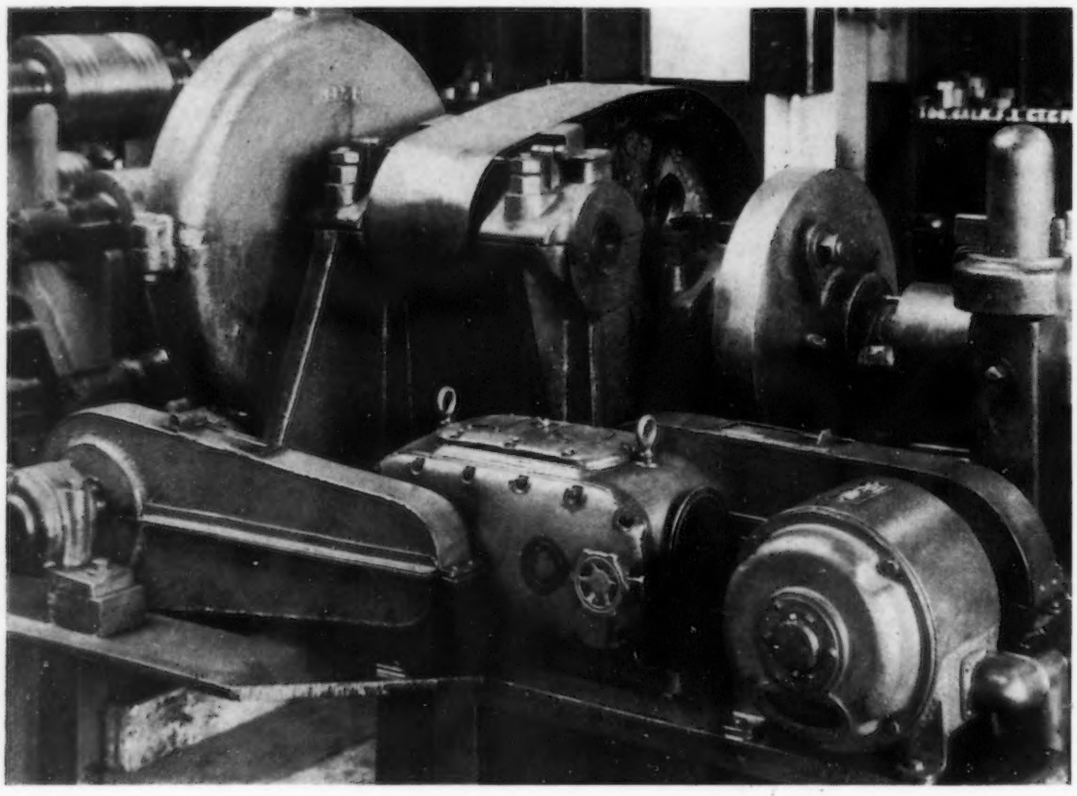
Heat treatment—continuous process ovens and furnaces.

Chemical engineering equipment—in the cement, lime and clay industries, screw type kiln feeders, powdered coal feeders, auger machines, tunnel kiln car pushers, continuous kiln conveyors; in the food products industries, dough dividers, overhead proofers, cracker-cooling conveyors, icing trolleys, dough sheeters, dough depositors, candy cooling tunnels, continuous cookers, blanchers, sorting tables, scalders, disk feeders, feed mixers, molasses pumps, grain cleaners and wheat washers; in the glass industry, lehrs, batch loaders, glaziers and automatic batch weight regulators; in the soap industry, screw-type pumps, soap dryers. Miscellaneous; traveling water screens.

Many important industries are not touched upon at all in the above listings. Numerous special cases, however, call for the widespread use of variable speed control in practically every phase of the operations in the textile, wood-working and meat-packing industries which the limitations of this article do not permit of adequate discussion.

Ratios and Horsepowers

Selection of the proper size and range of speeds of a variable speed



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LINK-BELT P.I.V. gear with Link-Belt chain drives, driving lathe worm shaft on a 9 in. diameter roll-machining job.

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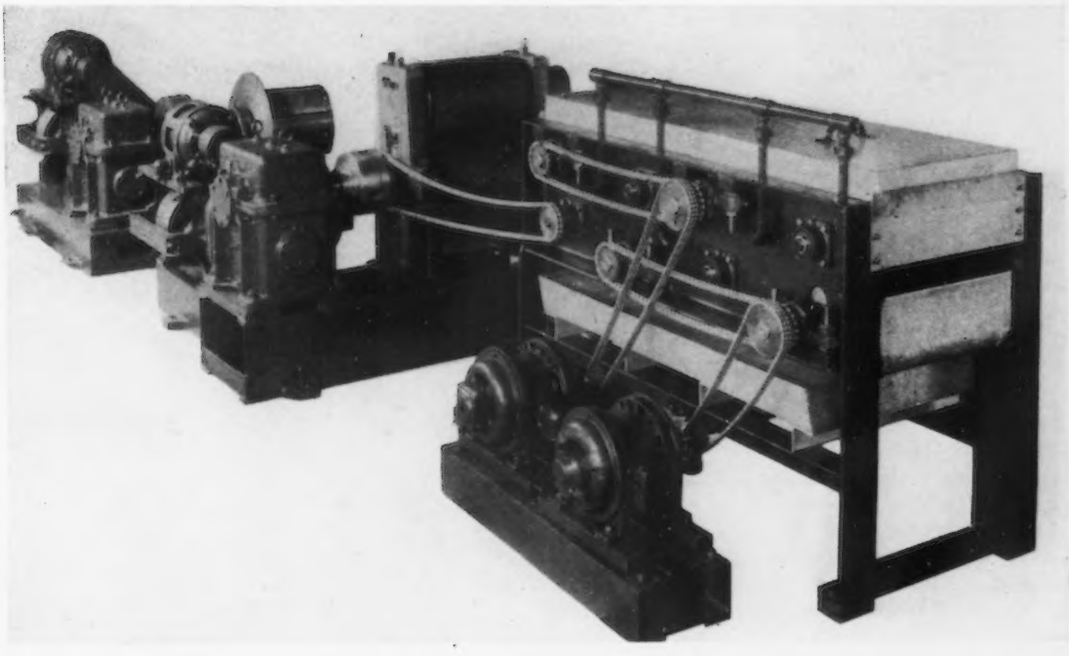


REEVES variable speed units with James worm gear reducers on pull-out roll and take-up reel, handling strip metal from pickling bath.

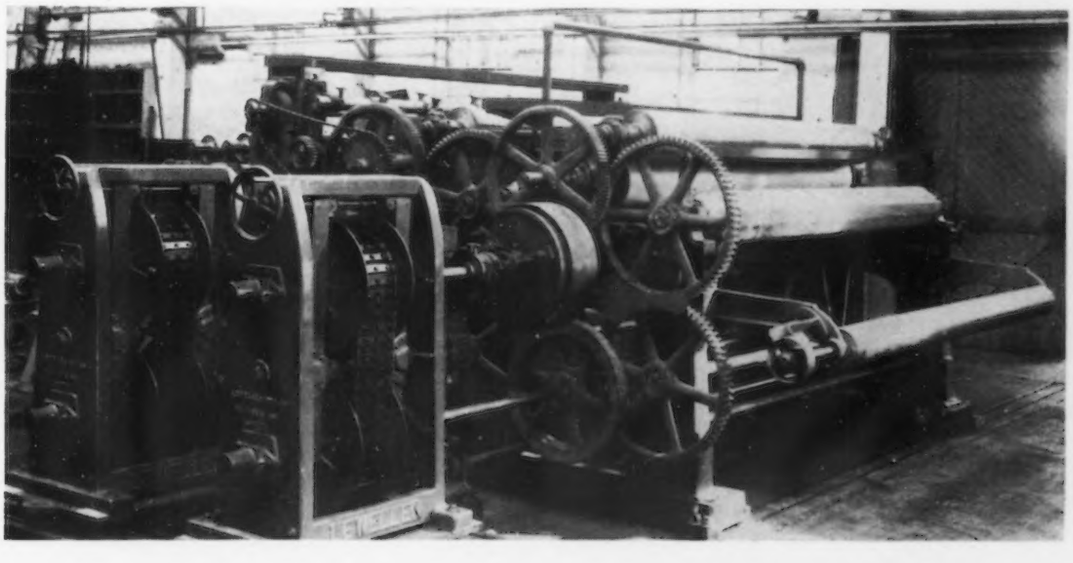
transmission device is determined by (1) the horsepower to be transmitted and, (2) the full range of speed variation desired. For most applications the unit will be required to operate at constant torque; that is, the horsepower required to drive the driven machine increases or decreases in proportion to the speed in revolutions per minute of that machine. In all such cases the *maximum* horsepower capacity of the transmission unit at the highest speed of the output shaft will be a governing factor. In other cases, constant horsepower is required throughout the whole range of operation at all speeds; and in these cases, the *minimum* horsepower capacity of the transmission unit must be equal to the maximum drive requirements.

A variable speed transmission unit should not be selected of less horsepower capacity than the motor to which it is connected, since, should the driven mechanism stall and the motor continue running, the transmission unit becomes the weakest link in the chain of operations, and is apt to suffer damage.

Reeves and Lewellen type variable speed transmissions are made in open and inclosed types for horizontal and vertical applications. In the various sizes the capacities range from fractional to 100 hp. In all capacities speed variations are available up to ratios of 6 to 1, and in certain medium capacities the ranges are up to 16 to 1.

The Link-Belt P. I. V. gear is available in the inclosed type only, as the mechanism runs in a constant bath of oil; and for horizontal or vertical applications. In five sizes the capacities range from one to 15 hp., with speed variation ratios ranging in each size up to 6 to 1. The Link-Belt V. R. D. unit is made in one size only, with a maximum capacity of ½ hp. and a maximum ratio of speed variation of 10 to 1.

The Oilgear fluid power variable speed transmission units have a constant torque motor, with maximum torque available at all speeds. In the integral units, four sizes are now available with capacities ranging from 2 to 20 hp. and a range of speed variations from 5 to 30 r.p.m. minimum, depending upon the nature of the load



TWO Lewellen variable speed units coupled directly to shafts of a paper or paper-board cutting machine.

and the type of the machine driven, to 1090 r.p.m. maximum, in either direction. Where separate pump and motor units may be used, the motor unit may be of either the constant displacement or variable displacement type, and the capacities range from 2 to 100 hp., with a range of speed variations similar to the integral units.

Reeves and Link-Belt transmissions may be had with integral-built electric motors; Reeves, Link-Belt and Oilgear transmissions may be had with integral-built gear-reducer units; and all types may, of course, be direct-coupled to, or drive chain or belt-coupled separate gear-reducer units.

(In a later chapter, under the heading of "Pulleys," there will be included descriptions of various single pulley type variable speed devices, such as the Reeves Vari-Speed motor pulley, the Allis-Chalmers Vari-pitch sheaves, the Equipment Engineering Hi-lo pulley, etc.)

Controls

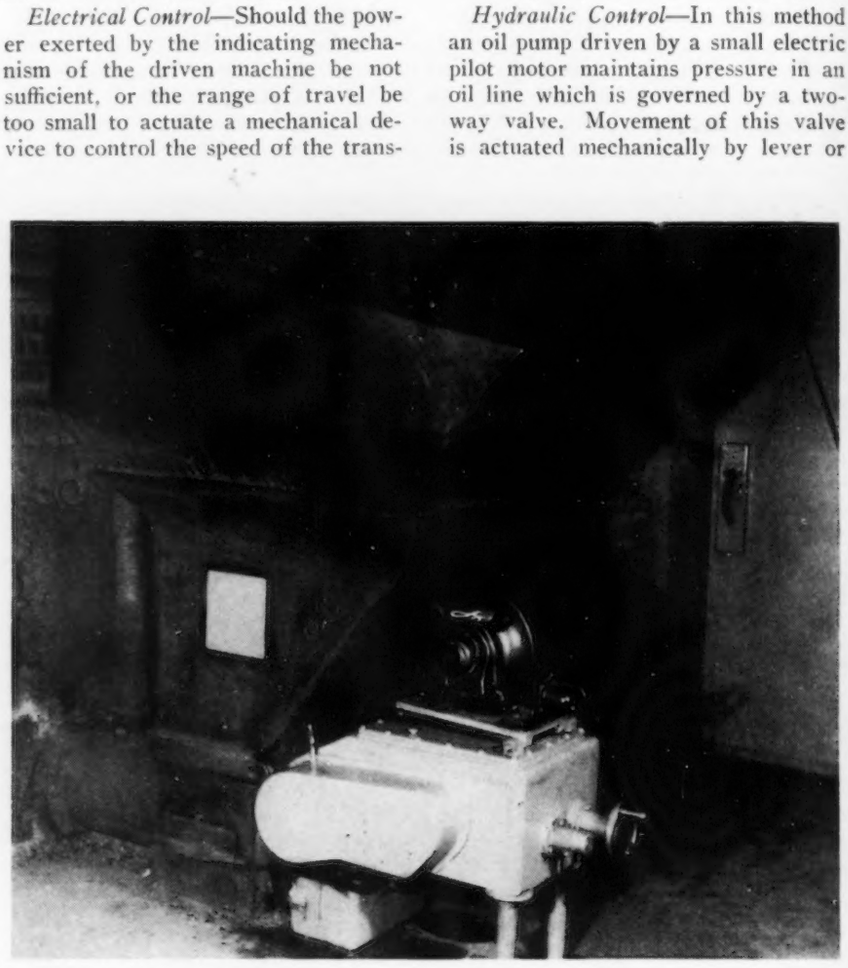
The control of variable speed transmissions may be either manual or automatic. Manual control is generally to be had by means of a hand wheel located on the case of the transmission unit, with a pointer to indicate either the speed of the output shaft or the ratio of speed variation between the input and output shafts. The hand wheel shaft movement is multiplied through a worm-and-screw, or gear action, so that a large movement of the wheel results in a small variation of speed ratio, thus providing for close regulation of speed.

Automatic control may be mechanical, electrical, or hydraulic. The three methods differ, as to application; largely by virtue of the sensitivity of the response required to the demand for speed variation by the driven mechanism, and by virtue of the power and range of travel of the speed variation indicator of the driven machine.

Mechanical Control—Where the driven machine embodies some speed indicating movement of sufficient power and range of travel to operate a substantial lever, the automatic control may be mechanically actuated. The hand wheel and its multiplying movement is replaced by a lever or other similar mechanical movement which is directly connected to a moving function of the driven machine. A series of conveyors may thus be linked to secure uniform speed for each, by having the variable speed transmission drive of one controlled by the speed of travel of the conveyor just preceding it in line; or the tension held uniform in the material fed to a winding reel by a connection which regulates the speed of the reel in accordance with its enlarging diameter.

Electrical Control—Should the power exerted by the indicating mechanism of the driven machine be not sufficient, or the range of travel be too small to actuate a mechanical device to control the speed of the transmission unit, it is customary to use an electric automatic control device, consisting of a small pilot motor mounted on the transmission case to do the work of altering the speed ratio, and an automatic electric control switch employing rheostats, magnetic contactors or relays, on the driven machine, actuated by a small lever mechanically connected with a speed indicator on the driven equipment. Thus, the rate of feed of a stoker may be controlled by the steam pressure indicator of the boiler. It is advisable to make sure that the connections to, and the automatic control switch itself, are of such design that, when contacts are formed in the switch to increase or decrease the speed of operation of the drive equipment, the first effect is to bring the contacts to a neutral position, and the second effect is to make the proper contacts for a definite required speed. Thus the phenomenon known as "hunting" may be eliminated; a phenomenon which may be described as a pendulum-like swing to both sides of the required speed point in the effort to attain the actual desired speed.

Hydraulic Control—In this method an oil pump driven by a small electric pilot motor maintains pressure in an oil line which is governed by a two-way valve. Movement of this valve is actuated mechanically by lever or cam connection to the driven machine indicator, and admits oil to one side or the other of a fluid motor, the output shaft of which is connected directly to the speed variation mechanism of the transmission unit. This control is very sensitive, so that a change in pressure in the oil line of but two or three ounces is sufficient to cause a change in the speed ratio of the transmission unit. Since the control by oil pressure is positive, all "hunting" is eliminated, and any desired change of speed is gained both rapidly and surely.



Actuating Mechanisms—The control actuating device on the driven machine will, of course, vary as the character or type of machine. Of the many mechanisms available the following are among those most generally used: floating rolls, follower rolls, cam controls, diaphragm regulators, governor controls, differential controls, photo-electric tubes, dancer rolls, knife carriages, steam pressure

regulators, ratchet controls, levers, and scale-beams.

Desirable Qualifications

In the selection of a variable speed transmission unit, certain qualifications play important economic parts. So important are the advantages provided by complete speed adjustability that the equipment used for that purpose should be carefully checked against all the qualifications which influence the utmost efficiency of power transmission at variable speeds. In tabulating the following points, therefore, adapted in large part from the Reeves Pulley Co. "Speed Control Handbook," it has been considered that economy derives from trouble-free, low maintenance-cost power applications of high efficiency and general utility.

1—Definite transmission of the applied power. At all speeds and under varying loads, the transmission of power should be of definite, dependable value. Fluctuation or slippage invalidates the essential principles of variable speed *control.*

2—Infinite speed adjustability. Between the high and low limits of the transmission unit, any and all speeds should be instantly available, in smooth gradation and without steps, while the driven machine is in operation.

3—Proportionate power consumption. The consumption of power for all normal installations should be directly proportional to the speed of the output shaft; maximum speed taking the maximum power consumption.

4—Wide ratios of variation. For utmost all-around usefulness, a few limited speed ratios are not sufficient. The range of available ratios in any single unit should be as wide as possible to meet any normal service requirement.

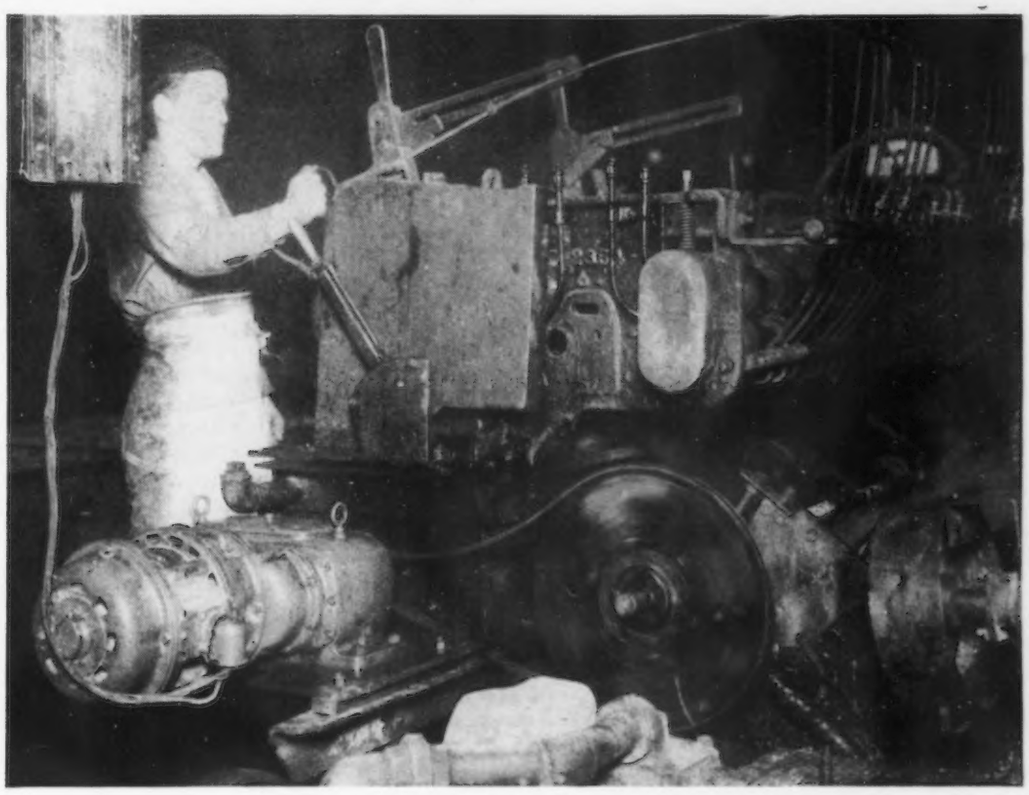
5—High efficiency of operation. Since variable speed transmission equipment is one more mechanism interposed between the source and the final application of the power, power losses in that equipment should be negligible. As much of the power input as is reasonably possible should be delivered to the driven machine.

6—Simple design and construction. To insure trouble-free performance and low maintenance costs, the design and construction of the unit should be simple, durable, and easy to maintain.

7—Compact and adaptable. Since it is auxiliary equipment only, the variable speed transmission unit should take up the minimum amount of space, and should be adapted to mounting on the floor, ceiling, wall or platform, or in or upon the driven machine, in any necessary position. The unit should rotate in either direction, and be adapted to receive and transmit power from and to either side of the driven machine.

8—Reasonable range of sizes and controls. Various applications require different sizes of variable speed transmission units. A limited range of sizes, therefore, will not serve many requirements. Controls should be primarily manual, but fully adapted to any degree of automatic operation.

The more nearly these qualifications are met, and the more carefully is the unit under consideration adapted precisely to the work in hand, the more economical will its operation be. With the increasing use of variable speed transmissions in every industry we are gradually approaching the ideal application; that is, a speed control which is automatically actuated by *any* variation of operating conditions demanding a change of speed for most efficient operation, such as variations in the density, toughness, molecular structure or temperature of the material worked, variations in the temperature, humidity or gaseous content of the surrounding atmosphere, or variations in the speed of production machine operation affecting the speed of a piece of materials handling equipment leading toward or away from it.



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STEPHENS-ADAMSON J. F. S. disk type variable speed transmission unit used to control the operating speeds of a power plant stoker.

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AT RIGHT

LINK-BELT motorized P.I.V. gear driving, through Link-Belt roller chain, the feeder roll on a tinning machine in a tin mill plant.

Recent Developments in Metal

BRIGHT plating of both zinc and nickel is gaining wide acceptance and two leading companies are pushing proprietary processes, described in this review. Other developments mentioned include a fully automatic time-cycle method for anodic treatment of aluminum, a plating rectifier, acid bucket, rubber and enamel compounds for plating tanks and racks, a metal spray gun of universal application, three-dip degreaser, a new type of sandblast gun, static-proof sandblast hose, several new types of shotblast cleaners, a magnetic separator for enameling frits, a color mixer and a number of new finishes, including acid-proof paints and perspiration-proof lacquers. Next week's review will cover machine tool announcements of the past month.

WITHIN the last two years, there has been a decided swing to bright zinc coatings in place of cadmium as the price of that metal rose due to the demand of the automotive industry for its use as a bearing alloying element. One of the most recent developments of apparatus for bright zinc plating is a mechanical cylinder or barrel now being supplied by the *Hanson-VanWinkle-Munning Co.*, Matawan, N. J., for use with the Mazic process. By this plating process, the necessity for subsequent bright dipping is practically eliminated.

The solution recommended for use with Mazic is similar to the solutions generally used for barrel zinc plating, as follows:

Zinc cyanide	12 oz. per gal. of water
Sodium cyanide	4 oz. per gal. of water
Sodium hydroxide	8 oz. per gal. of water
Mazic Brightener No. 3	3 lb. per 100 gal. of solution

This solution will be found by analysis, after all the salts are dissolved to consist of:

Zinc	6-7 oz. per gal.
Total sodium cyanide	14 oz. per gal.
Sodium hydroxide	8 oz. per gal.

The ratio of the metal content to total sodium cyanide should be maintained at 1 to 2½. Should the total sodium cyanide concentration decrease below this ratio, the brightness diminishes. Sodium carbonate content should be kept below 10 to 12 oz. per gal. or there will be a decrease of solution efficiency. As at high temperature the carbonate formation is accelerated, the solution should never be allowed to become warmer than 100 deg. F.

The optimum amount of Mazic brightener No. 3 is ½ oz. per gal. When the plating solution is operating at its best, the brightener consumption is very slow, about 2 oz. per 100 gal. per 8-hr. day, but this varies according to local conditions. Brightener should be dissolved thoroughly in *hot* water before being added to the plating bath. The solution can be analyzed easily by the method used for regular cyanide solutions.

To deposit 1 oz. of zinc, 23.3 amp.-hr. is needed. To deposit 0.001 in. zinc, 13/7 amp.-hr. are required. Apparatus must be supplied with current from a 10- to 12-volt source. At least 200 amperes should be drawn on the average size barrel. Ball anodes in spiral wire containers are recommended.

In operation, the solution temperature will rise because of the large amount of current going through, and when a bath is being operated continuously, provision should be made for cooling. It is economical to circulate the solution, since this saves the sodium cyanide required to maintain the bath at proper concentration.

After the work is plated the cylinder should be taken from the tank and rinsed thoroughly in clean cold water to avoid staining. After rinsing in cold and hot water, the work is transferred to baskets, centrifuged and dried. If the parts are small and light, they should be tumbled in clean, heated hardwood sawdust.

As in all bright plating operations, the brightness of barrel plated zinc depends somewhat on the lustre of the surface being plated. A good grade of cold rolled steel will give a better finish than, for example, pickled hot rolled stock. Gray and malleable iron castings have always been difficult to plate in any cyanide solution. Freshly sand blasted or rolled castings requiring only a weak acid dip usually plate satisfactorily, but a prolonged stronger acid dip may be necessary to remove oxide and rust, and they change the surface of the work so that zinc will not deposit.

Any impurities in any bright zinc plating solution have a highly detrimental effect. The material recommended for the barrels or cylinders is either Mercilite or hard rubber.

Bright Nickel Plating

With bright nickel plating, the necessity of copper buffing before nickel plating is eliminated as are most if not all, buffing, tumbling and "coloring" operations needed to give the nickel coating the proper lustre for the final chromium plated finish. Bright nickel deposits are now being secured in deep recesses, making the process applicable to die castings, brass and steel parts of irregular shape, and hence expensive to buff. Because of the saving in subsequent operations and the fact that no nickel is lost and that rejections through cutting through the plate in buffing are eliminated, savings between 25 and 50 per cent in costs over dull nickel plating are estimated. There is additional saving on parts plated on simple racks or wire that may be taken directly from the nickel bath to the

Finishing Processes

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By FRANK J. OLIVER
Associate Editor, The Iron Age

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chromium plating bath without reracking.

In recent weeks, the *Udylite Co.*, of Detroit, has announced a new process of bright nickel plating that fulfills all the general advantages stated above. Udylite's process is said to produce a smooth and ductile film as well as a bright surface. The solution itself is a stable, easily controlled bath having good throwing power or ability to deposit into recesses. The operating efficiency is said to be around 98-99 per cent. Lustrous nickel deposits are obtained over a wide range of plating conditions. Materials for the Udylite process are furnished at competitive prices and no special royalties or fees are connected with the process, but Udylite engineering supervision is included as a service feature.

Anodic Treatment of Aluminum

The *Hanson-Van Winkle-Munning Co.*, Matawan, N. J., has built for use in the anodic treatment of aluminum some motor-generator sets of large size that are equipped with automatic control devices designed to vary the generator voltage through a predetermined cycle as required for the specified treatment of a batch of aluminum parts.

For normal operation, parts to be anodized are cleaned and hung in anodizing bath and a button is pressed to set the automatic control. A motor driven field rheostat increases generator voltage from 5 to 40 volts in a period of 8 min. On the completion of the 8-min. treatment, a synchronous motor driven timer starts to operate. The generator voltage is held at 40 volts until the timer completes its operation (normally 30 min.) at which time the generator field circuit is opened and a warning signal announces that the cycle is completed. The control automatically resets.

During the treatment cycle the voltage and current are recorded by graphic meters on strip charts, dated and numbered to correspond with the batch number. These charts plus a similar temperature chart and a record of the solution analysis constitute a complete record of the treatment.

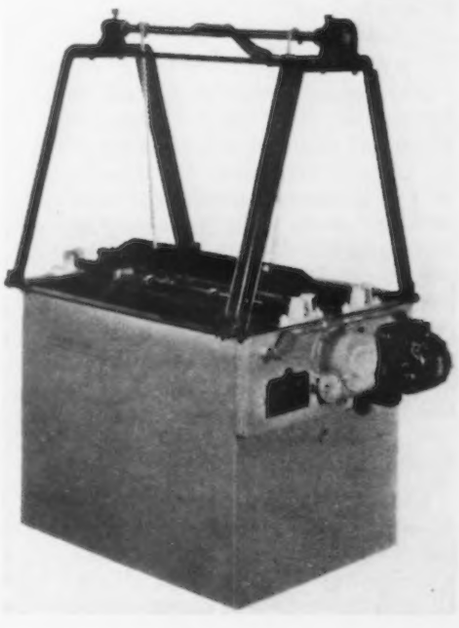
The generator control panel includes the regular indicating instruments and equipment for visual and manual control. The automatic control includes the motor driven field rheostat and timer manufactured by the *Ward-Leonard Electric Co.* and graphic recording ammeter and voltmeter manufactured by *Roller Smith Co.* Auxiliary equipment includes overload and reverse current relay and indicating and signalling devices.

The normal rating of the generators is 1500 amp. at 50 volts, continuous operation. They are driven by 125-hp. synchronous motors mounted directly on the generator shaft and have 125-volt exciters. The common subbase, motor and generator rings, etc., are built of heavy steel shapes and plates fabricated by arc welding.

Hanson-Van Winkle-Munning is also offering a copper-oxide plate type rectifier, assembled from Westinghouse units, for converting a.c. into d.c. for electroplating uses. Among the outstanding features mentioned are freedom from moving parts and hence lower maintenance costs, high overall efficiency and high power factor, and low installation cost, since no special foundations are required.

Acid Bucket

A new and improved Flexite acid bucket has recently been introduced by the *B. F. Goodrich Co.*, Akron, Ohio, which provides greater safety in handling corrosive liquids. This bucket is made of a semi-flexible material which will not crack or break under normal use. The reinforced



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THIS Hanson-Van Winkle-Munning mechanical plating barrel was especially designed for bright zinc plating by the Mazic process, completely described in the text.

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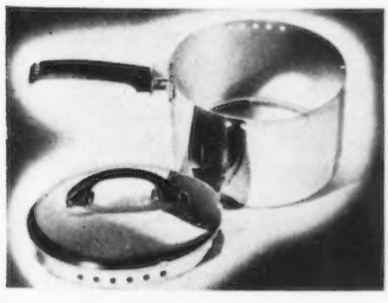

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AN example of the throwing power of the new Udylite bright nickel plating process is this 8-in. saucepan, which has been flashed with copper, then bright nickel plated. Base metal is cold rolled steel finished with No. 200 emery in grease prior to plating.

THIS Triflex rubber-lined steel tank is one of two supplied the Knapp-Monarch Co., of St. Louis, by the B. F. Goodrich Co. for Harshaw bright nickel plating service. All plating racks are coated with Korolac, a synthetic rubberlike material, also developed by Goodrich, which eliminates loss of nickel previously plated out on the racks.

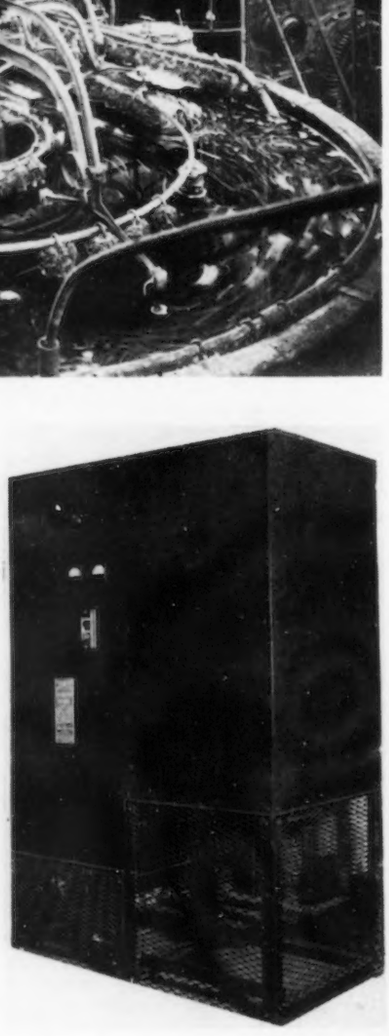
bead on the base is enlarged and recessed to permit the worker to get a firm hold with his gloved hands. A capacity scale is molded on the inside of the bucket, and when it is filled to capacity, liquid is still 2 in. from the top. Flexite buckets are available in 3-gal. size only. They weigh 3½ lb. each and are designed with steel reinforced hard rubber handles. Flexite dippers in 1 and 2-qt. sizes can also be obtained.

Plating Rack Enamel

An enamel for insulating all but the contact points of the racks used in chrome plating has been developed by *Maas & Waldstein Co.*, Newark, N. J. This enamel effectively insulates all parts of the rack, preventing the dissipation of the current. It is applied by dipping the racks (with the contact points protected by tape) into the enamel. Three or four coats are required, applied at intervals of about 2 hr. This enamel is supplied in red and black.

Crystallizes Salts from Pickle Liquors

The huge vacuum crystallizer illustrated is one of several designed and built by the *Swenson Evaporator Co.*, a division of *Whiting Corp.*, Harvey, Ill. It is of a type used extensively for



THIS compact copper-oxide plate type rectifier, assembled from Westinghouse units, is designed for electroplating use.

crystallization of salts from acid and corrosive solutions such as glaubers salt, copperas, zinc sulphate, steel mill waste, and pickle liquors. Crystallization is effected by removing the heat without transfer through any metal.

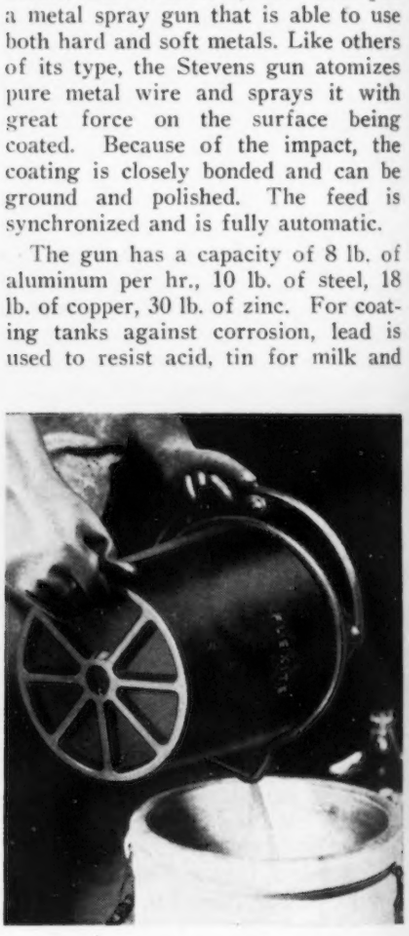
The main steel tank of this unit ranges up to 11½ ft. in diameter and up to 30 ft in height. As a protection against corrosion, it is lined with Triflex rubber, a special 3-ply rubber developed by the *B. F. Goodrich Co.* and shown elsewhere applied to large size plating tanks. At 3-ft. intervals, special built-in expansion joints permit the lining to contract or expand without danger of cracking.

The Triflex lining is called upon to resist chemical action, varying temperatures up to 150 deg. F., and vacuum. Its success in this service is in large part due to the Vulcalock process, which permits the acid-resisting rubber to be bonded to the steel shell with sufficient adhesion to withstand a vacuum of 25 to 29 in.

Metal Spray Gun

Increasing uses are being found for protective coatings of pure metal. To meet these new demands, *Stevens Metal Spraying, Inc.*, 83 Shipley Street, San Francisco, has developed a metal spray gun that is able to use both hard and soft metals. Like others of its type, the Stevens gun atomizes pure metal wire and sprays it with great force on the surface being coated. Because of the impact, the coating is closely bonded and can be ground and polished. The feed is synchronized and is fully automatic.

The gun has a capacity of 8 lb. of aluminum per hr., 10 lb. of steel, 18 lb. of copper, 30 lb. of zinc. For coating tanks against corrosion, lead is used to resist acid, tin for milk and



THE recessed base of the Flexite acid bucket gives a firm hold for a rubber gloved hand.

food machinery, and aluminum for accelerated oxidation in boilers and combustion equipment. Steel tanks and girders are coated with zinc after fabrication to protect the surfaces against atmospheric corrosion.

Three-Dip Degreaser

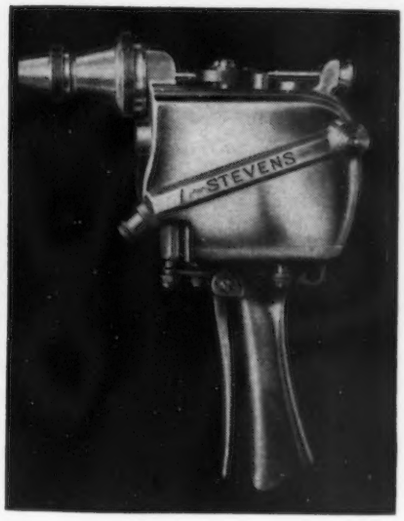
A three-dip, hand operated Detrex solvent degreaser is being offered by

the *Detroit Rex Products Co.*, 13005 Hillview Avenue, Detroit. As can be seen from the cut-away illustration, the machine consists essentially of three chambers separated by wide dams which act as heat insulators. The chambers, from left to right, are designated as: the boiling chamber, the rinse chamber, the vapor chamber.

The baskets containing the work are lowered by hand or by hoist into the boiling solvent in the first chamber where the heavy contamination is removed by the continuous sweep of the boiling solvent over the work. Immersing the work in the cool rinse in the second chamber lowers its temperature and at the same time flushes the work. A final cleaning, reheating and drying are effected by placing the work in the vapor chamber. The work emerges from this chamber clean, warm, and dry.

The vapors condense at the level of the water jacket and are collected in the trough and returned to the rinse chamber, insuring a continuous supply of clean condensate for rinsing. The machine is equipped with a thermostat indicator and valve, which is used to regulate the heat input, control the height of the vapor column, and insure maximum operating economy. A motor-driven solvent transfer pump is used for the transfer of solvent from any one chamber to any other chamber. Steam, gas or electric immersion heaters can be used as the heating medium.

Overall dimensions of this unit are: 7 ft. 1 in. long, 3½ ft. wide, and 5½ ft. high. Solvent capacity is 123 gal.



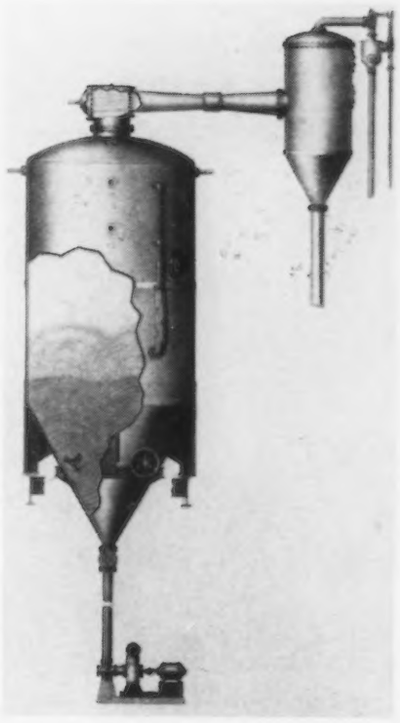
CHIEF feature of the Stevens model OZ-3 metal spray gun is that it can spray equally well soft metals, like lead or tin, or hard metals, like steel.

Sand Blast Gun

A new sand blast gun is being manufactured by *Michiana Products Corp.*, Michigan City, Ind., which incorporates features of design and principle said to provide better surfaces for painting and finishing wood and steel in much less time and without injury to the surfaces of the materials. Manufacturing rights have been obtained from the inventor, Frederick W. Schultz, superintendent of the shop of the A. T. and Santa Fe R. R., Wichita. It is connected to any 80 to 100-lb. air line.

AUTOMATIC cycle control of a Hanson-VanWinkle-Munning motor-generator set used in the anodic treatment of aluminum is obtained on this panel. Voltage and current are recorded by one graphic meter, and a second one records the solution temperature and analysis.

This gun has a chamber in which the sand meets a baffle that sets up a whirling motion, reducing the sand particles and increasing the number of cutting edges. Sand is delivered under pressure through a flattened orifice with abrasive-resistant alloy steel lips. It is claimed that this design permits the use of lower cost sand—removes grime, grease, and old finishes faster, and reduces buckling to a minimum on light materials without cutting or pitting the surfaces.



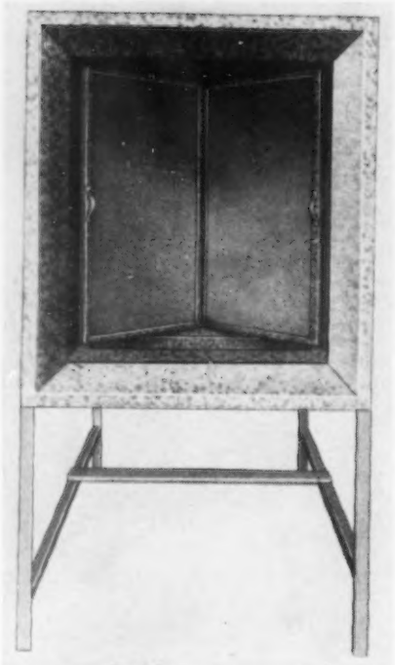
THIS Swenson vacuum crystallizer for reclamation of salts from pickle liquor and other acid solutions is lined with 3-ply Triflex rubber.

Sandblast Hose

A sandblast hose in which there is a ground wire in the heart of the hose wall has been introduced by the *B. F. Goodrich Co.*, Akron, Ohio, to overcome the accumulation of static. Static punctures, instead of puncturing entirely through the wall, reach only the wire, permitting the hose to continue in service with little damage and preventing static discharges from going through the operator's body. Wall thickness is somewhat greater than the standard type to permit insulation of the wire without materially reducing the cushion effect of the tube. Construction consists of a tube, one ply of fabric, helical wire coils embedded in rubber, three plies of fabric, and lastly the cover. Anti-static hose of this type is available in sizes from ¾ to 3 in.

Centrifugal Blast Abrasive Cleaners

A number of new designs of centrifugal blast abrasive cleaners have been brought out in recent months by the *American Foundry Equipment Co.*, Mishawaka, Ind. They are of two general types. The Wheelabrator Tum-Blast, represented by the new 36 x 42-in. model, uses an endless



THIS DeVilbiss spray booth has been especially designed for flock-spraying (textile fuzz). It is equipped with a metal curtain on top and sides, and a hinged door at each end gives access to the collection chamber. Overspray is collected in a recessed chamber beneath. Leg type booths come in 3 to 6-ft. sizes, and floor types in 8 and 10-ft. sizes.

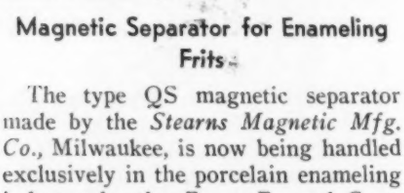
conveyor apron to convey the work through the blast zone and gently tumble it. The Tablast units, on the other hand, have a number of independent tables, mounted on a spider and rotated by a motor driven friction disk. The Wheelabrator unit, common to both types, throws abrasive by centrifugal force and the spent abrasive drops into a hopper which feeds it into the boot section of an elevator. A rotary screen removes useless fines, such as burnt foundry sand and forging scale, before returning it to a storage hopper.

The new 36 x 42-in. Tum-Blast unit will clean metal parts weighing up to 30 lb. Pieces weighing up to 75 lb. can also be cleaned by equipping the machine with a heavy-duty conveyor. Fragile parts that would be injured by the tumbling process can be cleaned on the Tablast type machine. A moderately priced, small size unit, illustrated, has been designed for cleaning small parts. The tables, the number and diameter of which can be varied, are rotated eight times to each foot of travel of the spider. A speed reducer on the table drives permits varying the speed of the work through the blasting area and prevents the possibility of over and under-blasting. Any desired finish may be obtained by using the proper size of shot or grit and adjusting the table speed for correct blast exposure.

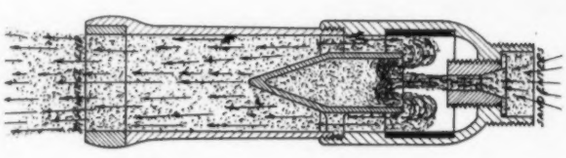
Another specially designed Wheelabrator Tablast, just announced, is for both rough and finish blasting operations on stove plate prior to enameling or japanning. Work to be cleaned is carried through the cabinet on four tables, 48 in. in diameter and rubber covered to prevent erosion of the metal plates. The rotating and translating action exposes every part of the work to the blast. When work is being cleaned for finish enameling, and electrically timed indexing system controls the movement of the table in and out of the blasting zone, so that each piece is given a thoroughly intensive cleaning.

Magnetic Separator for Enameling Frits

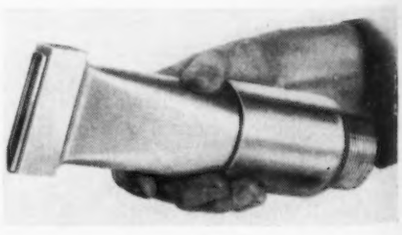
The type QS magnetic separator made by the *Stearns Magnetic Mfg. Co.*, Milwaukee, is now being handled exclusively in the porcelain enameling industry by the *Ferro Enamel Corp.* of Cleveland. This d.c. separator is available in five sizes, and the new type differs from former models in that it has twice the collecting area available, size for size. Instead of the usual magnets and screen cartridge, the QS model has a series of highly magnetized screens through which the liquid frit is filtered.



A BOILING chamber, rinse chamber and vapor bath comprise this three-dip Detrex solvent degreaser.



IN the Michiana sand blast gun, the sand meets a baffle that sets up a whirling motion which reduces the sand particles and increases the number of cutting edges, before the stream is delivered through a flattened orifice.



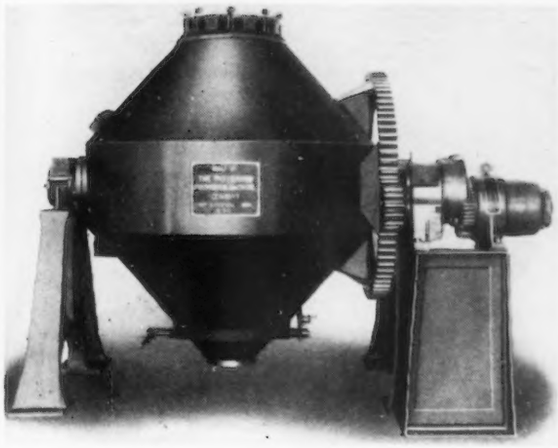
Every precaution has been taken to eliminate contamination in the ceramic materials being cleaned. The coil windings are completely enclosed in a machined cavity and then sealed with a moisture-proof compound. In case of current interruption, a direct-acting check valve closes and prevents material filtering through. The screen element is easily removable and is readily cleaned.

Color Mixer

A new conical type dry blender for colors, pigments, minerals and similar compounds has been placed on the market by the *Patterson Foundry & Machine Co.*, East Liverpool, Ohio. It is available in several sizes and is built in plain steel, stainless steel and other metals. It is claimed that absolute uniformity is achieved in very short mixing time, even when additions as small as one or 2 per cent are incorporated in a large quantity of material. An improved method of loading and discharging has been worked into this machine, and it may be easily cleaned so that many different materials can be handled in the same mixer.

Finish for Metal Office Equipment

After a number of years of research, *Sherwin-Williams Co.* has introduced a new specialty finish for office furniture and business machines. Known as S-W Satin-Glo, this finish is offered in two spraying and two dipping qualities, and is said to produce a finish of pronounced beauty, lustre and mar-resistance in one coat. It is also said to be resistant to severe abrasion, perspiration, chemicals and cleaning soaps. Satin-Glo is built around a chemically evolved vehicle designed to produce the toughest known finish when baked. The maker reports that for seven months batches were left uncovered to determine their

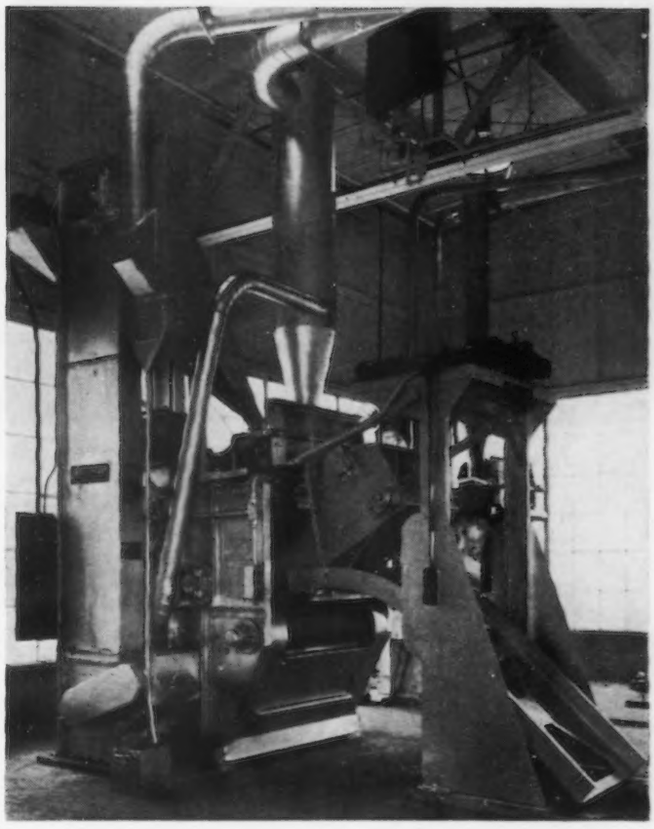


THE Patterson dry blender, which is available in several sizes and in a number of materials.

o o o

AT RIGHT

THIS 36 x 42-in. Wheelabrator Tum-Blast unit carries work under the centrifugal shot blast wheel on an endless conveyor.



"tank" characteristics, and by simply adding thinner to compensate for evaporation, the finish showed no evidence of skinning, separating, flooding, settling or thinning at the edges. The finish has been subject to all the usual service tests. It is being offered in olive green, or other colors if quantity requirement justifies special runs.

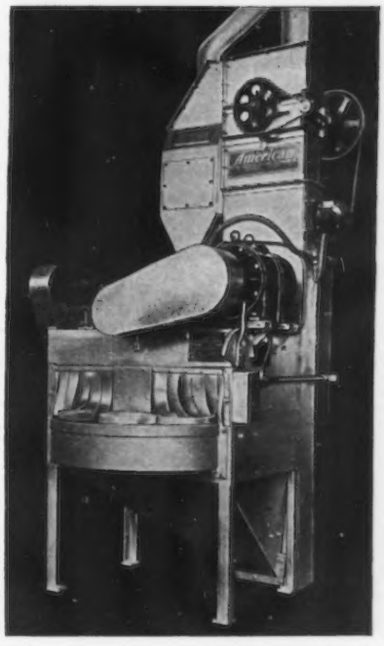
Acid Resisting Paint

Sarva acid resisting paint, recently announced by the *American Asphalt Paint Co.*, 43 E. Ohio Street, Chicago, is made from 99.5 per cent pure Gilsonite natural asphalt, special acid resisting resins and oils. It is made in a liquid and a compound. The former dries with a high gloss and the latter has a semi-gloss. Both products require about 12 hr. drying time. They come in red and black.

Sarva protects a surface from corrosion by acids, chemicals, alkalis and fumes. It can also be used for coating the inside of wood or metal tanks. For extreme acid or alkali conditions, one coat of Sarva compound over an initial coat of Sarva liquid will give extra protection. An ordinary paint brush can be used for either forms, or a spray gun can be employed.

Perspiration-Proof Lacquer

A clear lacquer that is resistant to perspiration has been developed by *Maas & Waldstein Co.*, Newark, N. J. It is applied by dipping or spraying and air-dries rapidly. After hardening for a few days, it becomes practically insoluble and resistant to moisture, soap and water, and perspiration It is useful for finishing products, such as flashlights, that are constantly held in the hands. It is supplied in grades suitable for finishing steel, copper, brass, and aluminum.



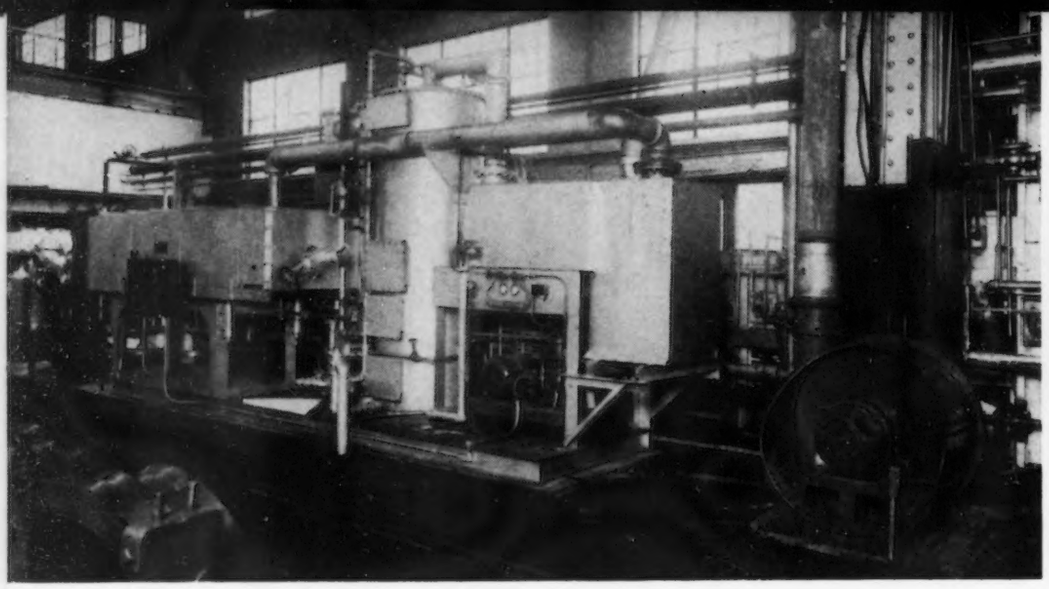
IN this small size Wheelabrator Tablast cleaning machine, the work is rotated on individual tables as it is carried through the blast zone on a rotating spider. A much larger unit has been designed especially for rough and finish blasting stove castings.

Among other products of the same company are a metal finish lacquer for rubber and a lacquer that resists rust inhibitors. The former consists of a bronzing liquid to which metal powder of any kind is added just prior to use. The mixture, which is applied by spraying, air dries rapidly and gives a strongly adherent, durable metallic finish on semi-stiff rubber. The latter is intended for use on equipment lubricated with oils containing rust inhibitors which ordinarily discolor lacquers. It also is resistant to humidity, salt spray and dilute acids, and because of its strong adherance to metal is especially suited to name plates.

THE spirally wound ground wire in this Goodrich sandblast hose prevents puncturing of the hose as a result of static discharges, besides protecting the operator.

Cleaning Soap

Magnus Chemical Co., Garwood, N. J., has brought out a soap cleaner, Magnus No. 55-P, for washing painted or varnished surfaces, floors and linoleum. It is a mild soap without any free alkali, but it contains an oil that revivifies the surface.



DX atmosphere gas preparation unit.

Modern Heat Treating of

FIFTY years ago, a steam pressure of 100 lb. per sq. in. was considered dangerously high. Twenty years ago, high steam pressure referred to anything above 150 lb.; today, pressures under 500 lb. are considered ordinary. Boilers operating at the critical pressure of water vapor, about 3200 lb. per sq. in., have been used successfully for several years in a number of European installations. In the United States, the trend toward higher pressures and temperatures, both in central stations and industrial plants, is firmly established as evidenced by numerous 1400 lb. installations, one of 1800 lb. in an industrial plant, a 2500 lb. testing boiler, and several experimental steam generators for pressures up to 5000 lb. per sq. in. Steam temperatures of 1000 deg. F. are not uncommon.

As pressures and temperatures go up, equipment specifications also go up. At elevated temperatures and pressures, small imperfections in equipment become magnified and assume major proportions.

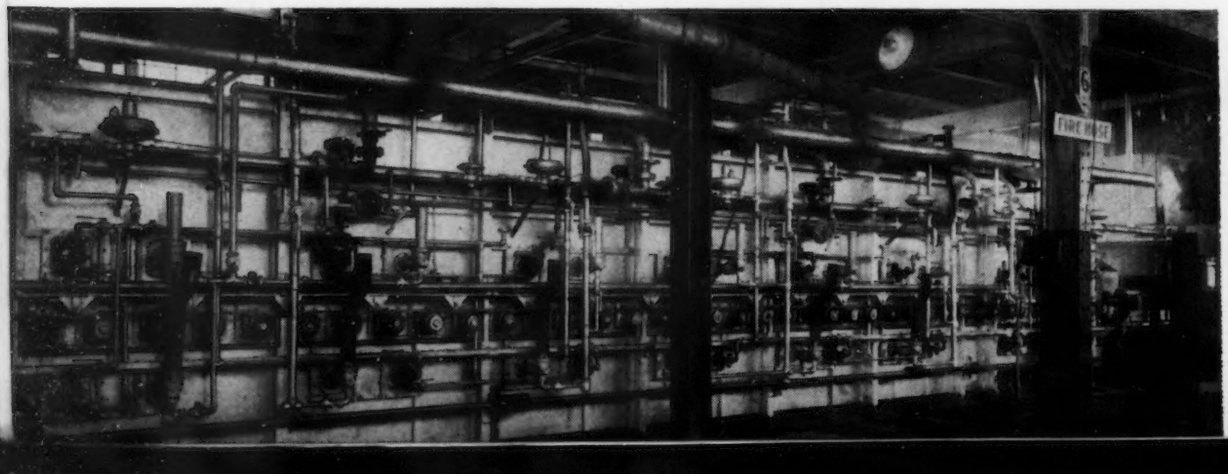
The most crucial parts of any boiler are the tubes. The painstaking efforts used by modern manufacturers of boiler tubing are exemplified in part by the recent installation of a surface combustion continuous controlled furnace at the Cleveland plant of Steel & Tubes, Inc., for normalizing, annealing and bluing boiler tubes.

This company specializes in the welded type tube sold under the trade name of "Electrunite." Hot rolled strip as received at this plant is carefully inspected on both sides, accurately cut to size, cold formed by rolling, and then welded by the patented Johnston welding process. Chemically, the steel is not altered by the welding operation, as the heat is generated by the resistance of the joint to the flow of an electric current, and no extra metal is added at the weld. The heat does not penetrate into the body of the metal.

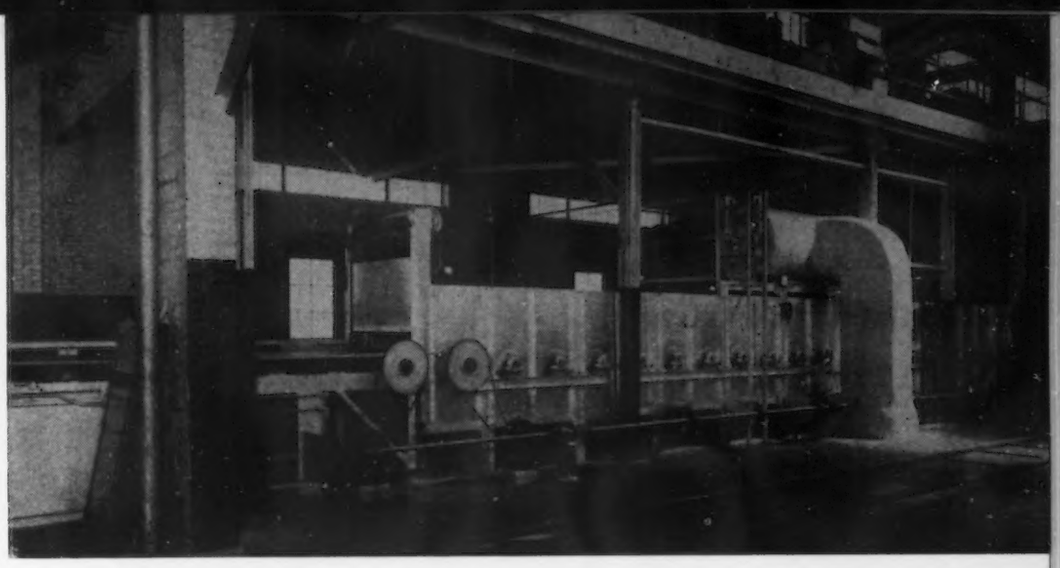
To obtain a more uniform microstructure and hardness, the tubes are normalized after welding. Normalizing completely recrystallizes the steel, relieving all welding and cold working stresses. This heat treatment restores uniformity to such an extent that it is virtually impossible to locate the point of weld under the microscope. At the temperature required for normalizing (1650 deg. F.) scaling tends to take place readily unless special precautions are taken to prevent it. While this scale can be removed by pickling, there is always the danger of acid embrittlement resulting from oven pickling as well as the additional handling costs. Furthermore, the surface after pickling is not quite the same fine dense cold rolled surface as before heat-treating.

The New Furnace

To meet increased production demands, it recently became necessary to install additional heat-treating equipment. To retain the fine surface resulting from cold working and to eliminate entirely the danger of acid embrittlement, a continuous gas-fired controlled atmosphere furnace was selected. This furnace is suitable for both annealing and normalizing, having a temperature range of 1200-1700 deg. F. It is heated by means of horizontal gas-fired radiant tube heating elements located both above and below the roller hearth conveyor. The boiler tubes in the furnace are at all times surrounded by a specially prepared atmosphere which prevents scaling or oxidization. The tubes leave the furnace with the same bright cold rolled luster they had before entering. The furnace has a capacity of 5000 lb. per



HEATING zone of furnace showing radiant tube heating elements mounted through side walls. Note burners with eductor at right of each.



BLUING oven. Note air heater on top.

Boiler Tubes

By J. M. BROWN
Surface Combustion Corp.

hr. and is capable of handling tubes ranging from ⅜ in. O. D. to 5 in. O. D. and up to 45 ft. in length. The internal dimensions of the heating zone are 4 ft. wide by 30 ft. long. Temperature variation within this zone is a maximum of plus or minus 10 deg. F.

At the discharge end of the heating chamber is a special cooling zone, 78 ft. long, with several unique features. This cooling zone is water jacketed on all four sides. In the cooling zone, the rollers are also water-cooled. In this zone all of the three methods of cooling; namely, radiation, convection and conduction, are incorporated.

Gas-Fired Heating Elements

The furnace is heated by means of gas confined entirely within tubes of heat-resisting alloy which become heated to incandescence and in turn radiate heat to the work. The heating tubes are "W" shaped with both ends outside the furnace. At one end of the tube is a special burner of the diffusion type which produces a long, soft, drawn-out, luminous flame reaching practically the entire length of the tube. The nature of the flame is such that a uniform heat release is obtained over the entire length of the tube. At the other end of the tube is a special eductor which pulls in the air required for combustion and at the same time exhausts the products of combustion. By means of the eductor, a suction is created within the tubes. In the advent of a leak, the furnace need not be shut down as the products of combustion cannot escape into the furnace and contaminate the atmosphere. Repairs to the tubes can thus be made when convenient.

Prepared Atmosphere

The boiler tubes in the heating and cooling zone are continually surrounded or immersed in a specially prepared atmosphere gas. This special or controlled atmosphere gas is prepared in a unit separate from the furnace by cracking natural fuel gas. After cracking, the gas is further refined by scrubbing, filtering, removal of sulphur and dehydrating. The resulting gas is non-explosive, will not break down at high temperature, and is free of oxygen. The approximate analysis of this gas is: Nitrogen, 74 per cent; hydrogen, 9.6 per cent; carbon monoxide, 8.7 per cent; carbon dioxide, 5.8 per cent; and methane, 1.9 per cent.

The prepared gas (DX gas) is fed into the furnace and cooling zone at a rate which keeps the furnace and cooling chamber slightly above atmospheric pressure, so that all leakage is outward. This leakage is burned at the entrance and exit doors of the unit, hoods with exhaust fans being placed directly above the doors, to remove any traces of incompletely burned gases from the building.

Bluing Furnace

The tubes, after leaving the normalizing furnace, continue on the roller conveyor across a space where they may be inspected or removed if a bright surface is desired. Boiler and pressure tubes, however, are not removed at this point, but are allowed to continue on the roller hearth conveyor through a bluing furnace. The purpose of the bluing furnace is to give the tubes a thin blue oxide coating, similar to the bluing on a gun barrel. This oxide forms a protection against rusting during storage and shipping. Heating of this furnace is entirely by a large convection air heater mounted on top of the furnace.

COOLING chamber at end of heating zone. Note water-cooled rollers.

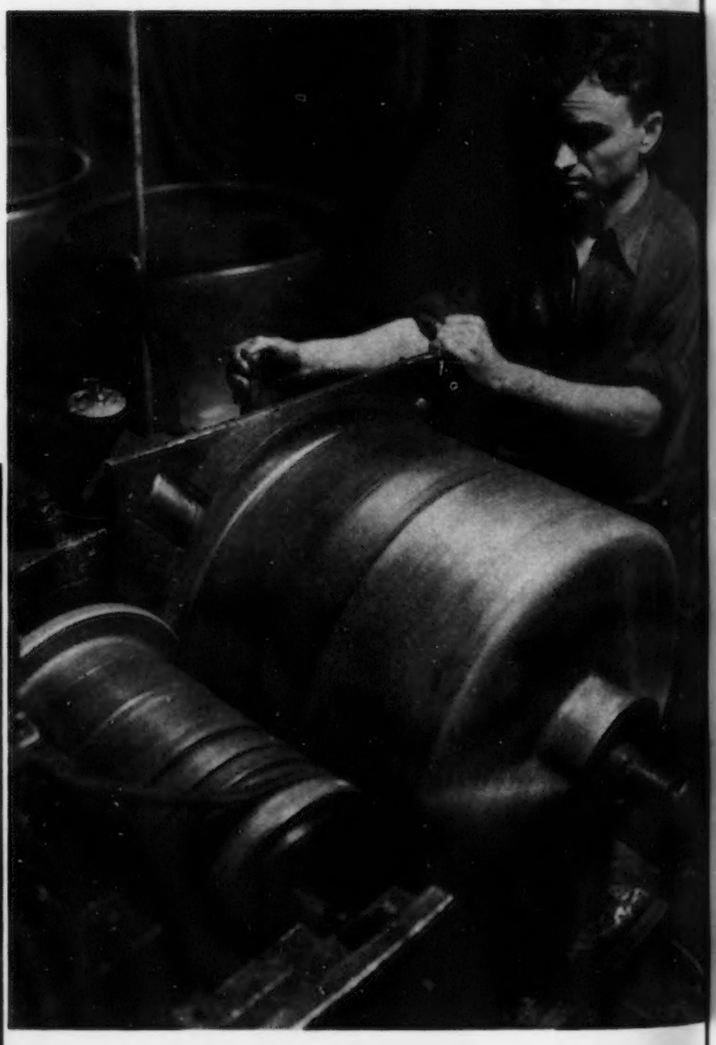
From Flat

AT LEFT

A DRAW of 16½ in. in a single operation from one sheet of enameling steel is about to take place in this one thousand ton press of the Alliance Porcelain Products Co. Note the plentiful use of beef tallow as a lubricant.

BELOW

DUCTILITY is an essential in an operation of this sort. The illustration shows the tub as it appears after the deep drawing operation. The 18 gage metal has lost only one or two one thousandths of an inch at any point in experiencing this severe draw.



ABOVE

AFTER a sizing operation which provides the tapered form required in the design, the tubs go to a rolling operation shown above. Here hydraulically applied rollers form the rounded streamline top. The shearing force exerted in this operation is equivalent to 40,000 lb. per sq. in.

Sheet to Finished Tub

THE making of porcelain enameled steel washer tubs is a process typifying high technological attainment in a number of operations. From the initial deep draw of the flat sheet to the final baking process one finds an object lesson in the value of quality and care in reducing loss to a minimum and in also securing a high grade product.

The story is told by the accompanying pictures and captions, which depict operations employed at the Alliance Steel Products Co. The enameling steel sheets used are USS Vitrenamel, made by Carnegie-Illinois Steel Corp.

ABOVE

CONSTANT inspection is required to maintain consistently high quality. The inspector swings each tub on its swiveling basket and runs his educated finger along the inside top flange, immediately detecting the slightest flaw even in this hard-to-reach spot.

o o o

AT LEFT

FOLLOWING a pickling operation and careful inspection for rust spots, splits or tiny flaws, the black tubs are dipped into the frit bath for the application of the enameling material. Note the smooth, even coating of the tubs in the background, denoting care in the selection of material and in the previous operations.

Economics and the Purchasing Agent

° ° °

By D. H. LYONS

° ° °

THE last few years have thrown a spotlight on the subject of economics. Today the man in the street is more cognizant of it than was the average high school graduate in 1920. Economics has grown from a dry, dismal subject to one of increasing popularity. Not because the subject has changed but because of the publicity it has been given. It is admitted that few people know what it is all about. Even the experts who discuss managed currency, supply and demand and laissez-faire are at odds over the proper interpretation of such terms as applied to present conditions.

These developments cause the purchasing agent to spend more time with the subject.

Economics has always been one of the factors considered by the purchasing agent in every transaction. Today, however, it has become one of the most important.

The relative position given economics naturally depends on the particular item to be purchased. In some concerns the volume of purchases may warrant the employment of a full time economist. In most cases purchases are such that the expense of this direct assistance is not warranted and the purchasing agent must assume the role of economist.

Before the economists rise in protest, let me hasten to explain the part played by the purchasing agent is not that of an economic authority but rather of an analyst who puts to work the facts and figures made available by the trained economist or statistician. Pure economic research requires constant study and attention, the like of which Mr. Average Purchasing Agent can neither entertain nor endure.

One of the Main Functions

One of the main functions of a purchasing agent is to buy materials to meet the productive needs of his company. Necessarily, therefore, his consideration of the economic factor must be tempered with an understanding of other requirements such as price, delivery, quality, accessibility, reliability of supplier, etc.

Probably the main difference between the economist and the purchasing agent is that the economist may inject theory into his forecasting and can deal in comparatively long periods of time whereas the purchasing agent must use the available data and operate over comparatively short terms.

For example, the economist may say the price trend of a certain item will be upward over the next several years. On this theory alone one might ask why doesn't the purchasing agent, if he accepts the statement as true, immediately set out to purchase his requirements and then sit back and wait for the profits to accrue?

We all know such a program is well nigh impossible. Where, for example, could you store two years' supply of coal or fuel oil or acid? In the old days you could make contracts for comparatively long terms and a 12-month agreement was commonplace. Today, contracts without a quarterly adjustment clause are about as scarce as a Democrat in Vermont.

On the other hand it is still possible for some companies to buy large quantities of raw materials. Those who may have the space to store them would probably hesitate due to many reasons. It may be unpredictable action by the Government, or the hazard of new developments in the laboratory or change in consumer demand.

In the main it is necessary for the average purchasing agent to confine his economic studies to comparatively short periods of time, say three months to eighteen months. That is, his studies will cover longer periods but his sphere of activity is usually restricted to the shorter periods. Because of this the interpretation of economic trends becomes more difficult. The economist who plots a price curve will say that, although the underlying trend is in one direction, the period in the interim will be subject to comparatively sharp sawteeth action.

A statement from a public official can, temporarily at least, knock a price chart on rubber or cotton or copper out of balance.

Competitive Positions

Such fluctuations may be of short duration but during the period the purchasing agent does not want his company to be in an unhealthy competitive position. Costs make up the foundation on which selling prices and profits are built. Because the purchasing agent can directly affect the cost figure he must necessarily be conservative. The purchasing department is no place for a gambler. If there are any chances to be taken they should be taken by someone else.

On the other hand the purchasing agent must be courageous and aggressive. He must have faith in his convictions which, of course, should be based on a thorough knowledge of the subject coupled with his best judgment of the immediate situation.

Fortunately for the purchasing agent there are many items which do not require an academic study before buying. Lead pencils will serve to illustrate. Few purchasing agents could afford to spend a great deal of time studying the underlying econom-

ics pertaining specifically to the manufacture and sale of pencils. The dollar volume is not sufficiently large in most organizations. In addition, the purchasing agent will have a superficial knowledge of the economics applying to office supplies in general and, upon weighing all other factors, can decide on his immediate buying program covering pencils.

On the other hand in many companies there exists a group of items which constitutes a large percentage of the total purchases. In these the purchasing agent must study the economics of each so that he will be in position to forecast future prices and recommend present action. In such cases the buyer's skill is weighed against all the hazards of doing business from social legislation and taxes to war scares and floods.

Another important function the purchasing agent can perform with the aid of economics is to consult with the management on items of capital investment.

A Council Member

The purchasing agent sitting as a member of the council can report conditions as he sees them so that the facts can be included in the final analysis of the subject. For example, the management may be considering the installation of certain equipment in order to service a particular industry. If the project has been under consideration for some time, production in that industry may have fallen off. The sales department would probably detect it but confirmation by the purchasing agent would be helpful.

In connection with sales the purchasing agent can assist by advising future price trends, attitude of vendors, type of contracts being offered and business conditions in general.

Economics and purchasing go hand in hand. The purchasing agent looks to the economist as a colleague who makes available facts and opinions that otherwise would be hard to find. In order that he may intelligently interpret the facts set forth the purchasing agent must be a student of economics. It might be said he looks at economics from a commercial angle using as a basis the academic viewpoint supplied by the economist.

Uses and Treatment of Industrial Metals Will Be Discussed at Metals Congress

THE uses, treatment and fabrication of various industrial metals will be the subject of more than 100 papers that will be presented at the Western Metals Congress, to be held in Los Angeles, March 21 to 25. A display of modern industrial metals and machinery will be held simultaneously with the technical sessions.

Based on the theme "Metals in Industry," the congress is being sponsored by the following technical societies: American Chemical Society, American Foundrymen's Association, American Institute of Aeronautical Engineers, American Institute of Electrical Engineers, American Institute of Mining and Metallurgical Engineers (Institute of Metals), American Petroleum Institute (California division), American Society of Civil Engineers, American Society of Mechanical Engineers, American Society for Testing Materials, American Welding Society, Chamber of Mines and Oils, Metal Trades and Manufacturers' Association, Mining Association of the Southwest, National Purchasing Agents' Association, Pacific Coast Electrical Association, Pacific Coast Gas Association, Society of Automotive Engineers, and the American Society for Metals.

A partial list of the papers to be read at the meeting follows:

Foundry Session

"Nickel Steels and Irons," by F. J. Walls; "Chromium Steels and Irons," by E. K. Smith; "Molybdenum Steels and Irons," by W. P. Woodside; "Vanadium Steels and Irons," by J. Strauss; "Improvements in Steel Castings by Moderate Alloying and Heat Treatment," by F. A. Melmoth; "Aluminum Castings," by H. J. Rowe; "Copper Alloys," by W. Romanoff, and "Die Castings," by W. W. Broughton.

Machinability Session

"Machining Bessemer Screw Stock," by J. D. Armour; "Machinability of Alloy Steels," by H. McQuaid; "Machinability of All Types of Castings," by E. K. Smith; "Machinability of Aluminum Alloys," by W. A. Dean, and "Other Non-Ferrous Alloys," by Harvey Anderson.

Welding Session

Pacific coast chapters of the American Welding Society will hold meetings in conjunction with the Western Metal Congress. Among the papers to be presented at the welding meetings are: "Weldability and Properties of Materials for Casing Strings," by I. Harter; "Design of Large Welded Pipe, Laterals and Supporting Structures," by Dr. W. F. Durand; "Shop Fabrication and Spinning of Protective Coatings," by L. L. Muffler; "Stainless Alloy Welded Plate and Castings Combined in Corrosion Resisting Pressure Equipment," by R. Jameson; "Welded Reinforcements and Attachments, Their Application and Placement on Pressure Vessels," by K. V. King; "Alloy Additions to the Chromium Steels and Their Effect on Welding," by H. D. Newell; "Design of Welded Connections in Building Construction," by P. Jeffers; "Resistance Welding Processes and Their Application," by S. Levyne; "Helping the Small Shop Welder," by J. C. Gowing; "Inspection of Welds and the Supervision of Welding Operators," by R. Craves, and "Welding Cast Iron," by Prof. G. S. Schaller.

Aeronautics Session

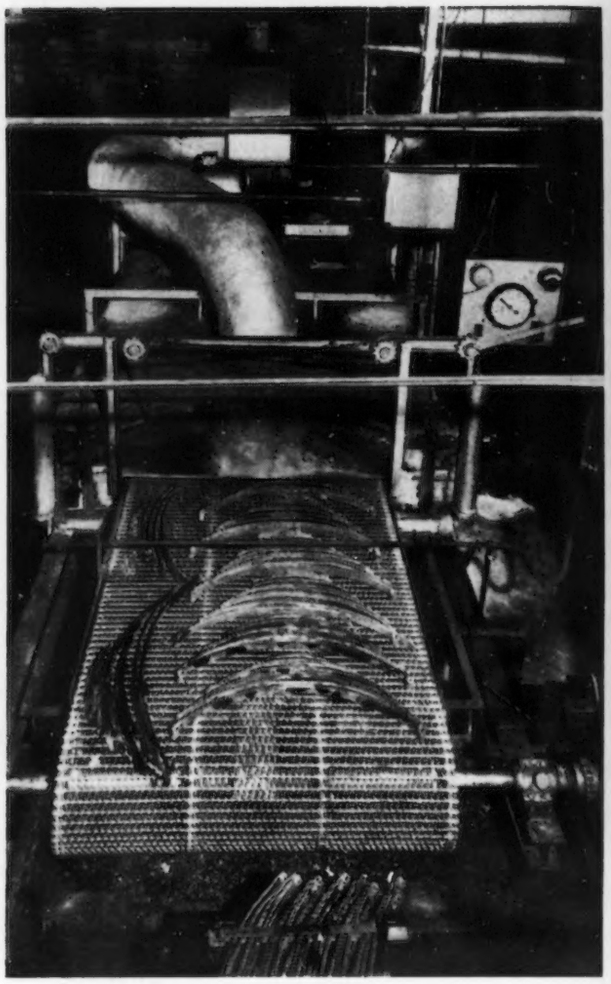
"Metals in the Aircraft Industry," by J. R. Goldstein; "Recent Developments in the Application of Magnesium Alloys to Aircraft," by Arthur W. Winston; "Design and Production of Aluminum Alloy Aircraft Forgings," by A. A. Handler and L. W. Davis; "Engineering Alloy Steels (S.A.E Specifications)," by Prof. B. Stoughton, "Steel Forgings for Aircraft," by Waldemar Naujoks; "Stainless Steel for Aircraft," by Carl de Ganahl; "X-Ray Inspection of Aeronautical Materials," by Tom A. Triplett, and "Aluminum in Diesel Engines," by P. B. Jackson.

Papers of General Interest

"Fabrication and Application of Stainless Steels Containing Up to and Including 16 Per Cent Chromium," by Prof. B. Stoughton; "Fabrication and Application of Stainless Steels Containing 18 Per Cent Chromium and Over," by Dr. V. N. Krivobok; "High Speed and Highly Alloyed Tool Steels," by J. P. Gill; "Flame Hardening," by G. V. Slottman; "S.A.E. Steels," by Prof. B. Stoughton; "Carbon and Low Alloy Tool Steels," by J. P. Gill; "New Developments and Applications of Hard Facing Material," by C. C. Pendrell; "Application of Hard Facing Materials," by D. Llewellyn; "A Review of Metallurgical Standards," by H. A. Anderson, and "The Part Aluminum Plays in Diesel Engines," by P. B. Jackson.

Dr. A. Allan Bates, manager of the chemical and metallurgical departments of Westinghouse Electric & Mfg. Co., will present a series of five lectures on the fundamentals of ferrous metallurgy.

Speed and Temperature Uniformity Emphasized in New Furnace



RAPID heating and temperature uniformity are emphasized in this new furnace.

A RECIRCULATING continuous draw furnace built by the Tuthill Spring Co., 760 West Polk Street, Chicago, for the heat-treating of all types of flat leaf steel springs is said to combine the best features of similar furnaces now in use, together with several new features, all to the end of securing a high operating speed combined with temperature uniformity.

The furnace units are made up of a large suction fan (7000 cu. ft. per min.) constructed of a special alloy and mounted over the main body of the furnace. This fan sucks hot gas through a stainless steel 16-in. pipe from the top of the discharge end of the furnace, then forces the gas through a duct between two oil burners for reheating to about 1200 deg. F. before it is redelivered to the sides of the furnace. The oil burners consume 8 to 10 gal. of fuel an hour. They are set at an angle of about 30 deg. to the center line and are located at the top of a "Y" shaped duct, the ends of which embrace the sides of the furnace and carry the hot gases underneath, at which point stainless steel ports direct the gases underneath the mat which carries the springs to be heat treated (see accompanying illustration).

No flames touch the steel. The temperature in the furnace is constantly maintained between 850 and 875 deg. F. by means of a controlling pyrometer and motor operated proportioning valve. There are also two indicating pyrometers operating from thermocouples located in the ducts leading to the sides of the furnace. Thus the gas temperature in each side of the duct is always known and under control. The gas in the furnace is recirculated about ten times a minute.

The Tuthill furnace speeds up production by having three ducts branching down from the center of the "Y" section and discharging hot gases over the work, as well as under it. Because of this greater entrance heating capacity, the work reaches soaking temperature by the time it has traveled about 10 ft. into the furnace.

The company claims to have made a test where two pieces of hardened S.A.E. No. 9255 steel, 5 ft. long were placed side by side in the furnace, one piece measuring 1¼ x 3/16 in. and the second measuring 3 x 7/16 in. After the one-hour travel through the furnace, Brinell readings were taken at 4-in. intervals across the length of each piece, and it was found that the hardness had held to a range of 430 to 402.

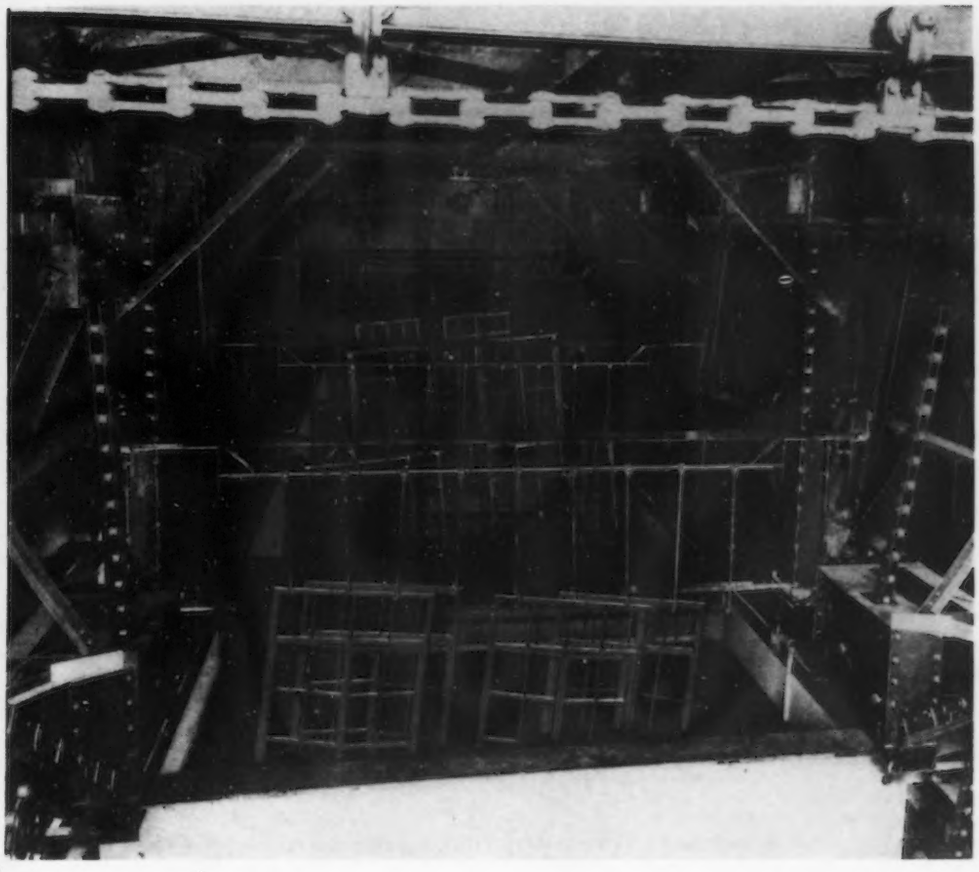
. . TRADE NOTES . .

Wailes Dove-Hermiston Corp., New York, through Julio F. Sorzano, announces appointment of the Aird-Don Co., Troy, N. Y., the Los Angeles Rubber & Asbestos Co., Los Angeles, Machinists' Tool & Supply Co., Los Angeles, and Universal Valve & Fittings Co., Cleveland, as distributers of Bitumastic industrial protective coatings. A sales promotion program is planned for early March.

Barney Machinery Co. has moved its offices to 537 Union Trust Building, Pittsburgh.

National Refractories Co., Inc., Philadelphia, organized in 1935 to handle Eastern sales of products made by Mexico Refractories Co., Mexico, Mo., M. D. Valentine & Bro., Co., Woodbridge, N. J., and other plants, has purchased the plant and other property of the Van Dyke Silica Brick Co., Van Dyke, Pa., and a major interest in the reorganized Big Savage Refractories Corp., Frostburg, Md. Principal offices of National Refractories, which will be headed by Roger A. Hitchins, president; J. B. Arthur, chairman, and J. H. Kruson, vice-president, will be at 1520 Locust Street, Philadelphia. District sales offices will be operated in Cleveland, Pittsburgh and New York.

Black & Decker Mfg. Co., Towson, Md., has opened a factory branch service at 630 Baronne Street, New Orleans, the 22nd branch to be established by this company.



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FOUR tanks of more than 7,000 gal. capacity each receive the steel windows successively during the Bonderizing process, the entire process being conveyor mechanized.

o o o

Fenestra Firm Completes New Bonderizing Plant

A NEW $200,000 Detroit plant has been placed in operation by Detroit Steel Products Co., of Detroit, in which Fenestra steel windows are treated by the bonderizing process, and the paint baked on by a new method.

To accommodate this improvement, Detroit Steel Products Co. erected a building 40 ft. wide and 234 ft. long, two stories high with a basement and sub-basement. It is devoted exclusively to the Bonderizing process.

Notwithstanding that Bonderizing is an accepted process which has been employed in the automotive, refrigeration and other fields for several years, its application to steel window manufacture on a production basis is entirely new.

It takes two hours and a quarter to complete the Bonderizing of Fenestra steel casements. During this period the steel frames travel continually on a moving chain receiving their various treatments as they pass along.

The first essential is to clean the frames of all oil, grease and foreign matter that has accumulated on the surfaces during the fabricating process. The slightest trace of oil or

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THE illustration shows two panels, painted and then scratched and subjected to a 20 per cent salt spray for more than 700 hr. The two panels are identical except that the one on the left was acid cleaned before painting and the one on the right was Bonderized.

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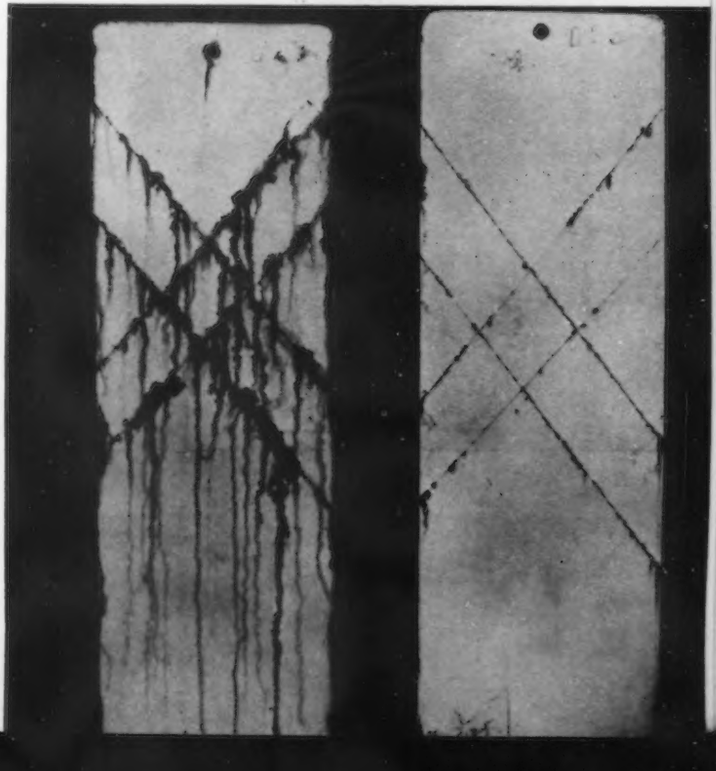


moisture will affect the unfinished metal and make it susceptible to rust. For this reason the Fenestra process is completely mechanized and the steel frames, once placed on the hooks of the process conveyor, are never touched by any hand until they have completed their journey and are ready for shipment.

After receiving a thorough "hot shower bath" as they pass through a cleaning tunnel, the frames take four successive dips into a series of tanks: the first is a rinse bath, the second contains the Bonderizing solution, the third is another rinse, and the fourth is a chromic acid bath.

When cooled, the frames descend into a vat of paint, from which they enter the baking oven, 74 ft. long, constantly maintained at a temperature of over 300 deg. Here they remain 45 min. while the paint is baked on. Emerging from this oven, the steel frames are air cooled and by the time they reach the end of their trip, they can be handled comfortably by hand.

New Dry Cyaniding Process Developed By Surface Combustion Engineers

DRY cyaniding, a new case hardening process which has been announced by Surface Combustion Corp., Toledo, Ohio, and which is a combination of continuous nitriding and continuous gas carburizing, produces a case similar in many respects to a cyanide case, although the process, unlike cyaniding, is carried out in a gaseous atmosphere which is a combination of carburizing gases and ammonia.

Cases have been produced on a variety of SAE steels at different temperatures. A variety of carburizing gases and ammonia may be used to produce cases with various concentrations of carbides and nitrides and ranging from a few thousandths of an inch to greater case depths.

Surface Combustion Corp. engineers report that a case may be produced at a temperature as low as 1150 deg. F. and that some specimens were found to be quite hard without quenching. A comparison between dry cyaniding and wet or liquid cyaniding may be had from Figs. 1 and 2, both of SAE 5145 steel at 300 magnifications. Fig. 1 shows a sample wet cyanided at 1490 deg. F. and quenched in oil. Fig. 2 shows a sample dry cyanided also at 1490 deg. F. and also quenched in oil. The hardness of the wet cyanided sample was found to be Rockwell "C" 58.5 as quenched, while the hardness of the dry cyanided piece was Rockwell "C" 62 as quenched.

The photomicrographs in Figs. 3 and 4 illustrate the effects of quenching on a dry cyanide case. Fig. 3 at 300 magnifications shows a piece of SAE 1020-90 steel dry cyanided at 1450 deg. F. and slowly cooled. Fig. 4 shows a piece of similar steel treated in an identical way but quenched in oil.

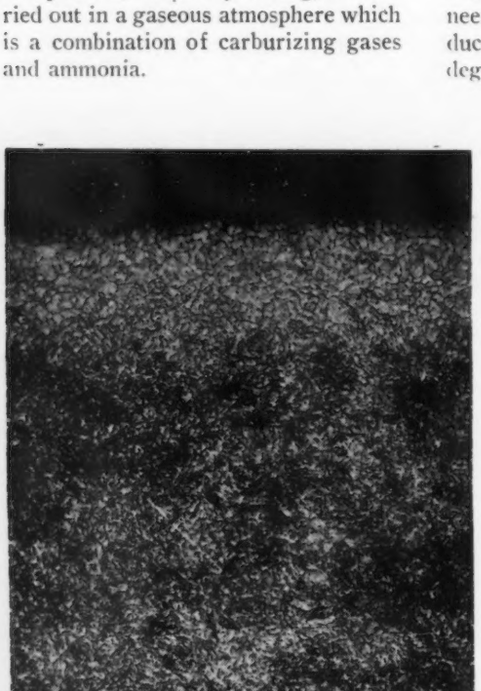
The equipment necessary for dry cyaniding is similar in many respects to that used for continuous gas carburizing. The work is loaded on trays and pushed through a muffle furnace in a continuous cycle. Atmosphere seals at both ends of the furnace prevent infiltration of air. The work upon emerging from the furnace is clean and no brushing is required.

As compared with wet or liquid cyaniding, the advantages may be summarized as follows, according to Surface Combustion engineers:

(1) The process is continuous and may be placed in a production line.

(2) A very uniform case is produced.

(3) In dry cyaniding, the character and



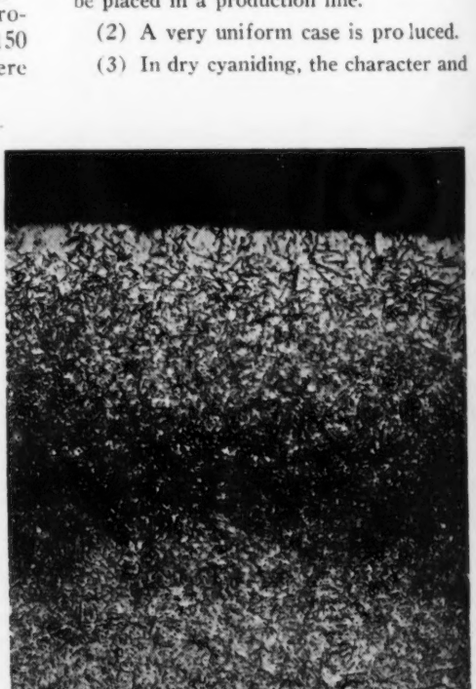
AT LEFT

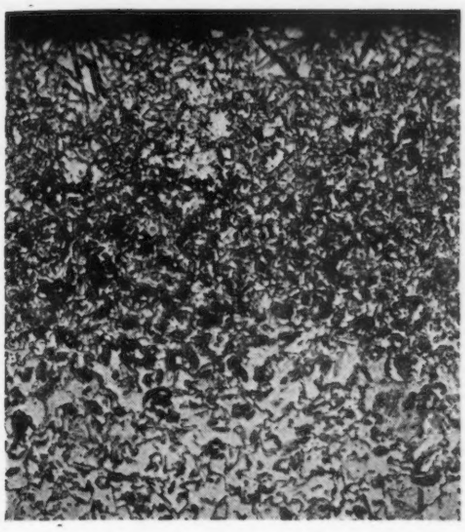
FIG. 1—Sample of SAE 5145 steel at 300 magnifications wet cyanided at 1490 deg. F. and quenched in oil.

o o o

AT RIGHT

FIG. 2—Sample of SAE 5145 steel at 300 magnifications dry cyanided at 1490 deg. F. and quenched in oil.





AT LEFT

FIG. 3—Photomicrograph illustrating the effect of quenching on a dry cyanide case. This is a piece of SAE 1020-90 dry cyanided at 1450 deg. F. and slowly cooled.

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AT RIGHT

FIG. 4—A piece of steel similar to that at left, treated in an identical way, but quenched in oil.

depth of the case may be definitely controlled so as to produce any desirable concentration and penetration of the carbides and nitrides.

(4) For certain applications a sufficiently hard case may be produced without quenching.

(5) Working conditions are cleaner.

(6) The over-all cost of dry cyaniding is lower than liquid cyaniding.

As compared with light case carburizing, this new procedure is carried on at a temperature considerably lower, resulting in longer life of the muffle and other alloy parts.

Steel Founders Adopt Plan For Training Of Apprentices

CLEVELAND.—A complete set of standards governing apprenticeship was presented to the 36th annual meeting of the Steel Founders' Society of America, meeting at Hotel Statler, Cleveland, Feb. 9-10, by a committee appointed last February.

Estimating that the industry loses about 7 per cent of its skilled men every year as a result of death, superannuation, transfer to other occupations and other causes, with some estimates of this loss as high as 10 per cent, the report outlined the responsibility confronting employers, the advantages of an adequate apprenticeship program, and suggested training schedules for various periods up to four years in length.

The annual meeting was attended by close to 150 steel foundry executives, the largest attendance ever held at a meeting of this society.

A. M. Andorn, Penn Steel Castings Co., Chester, Pa., discussed "Economics of Selling in 1938." A review of pending legislation affecting the industry and an outline of what has thus far been accomplished in the organization of operating executives groups throughout the industry was presented to delegates. Approximately 75 per cent of the capacity of the industry is now organized for the purpose of improving the quality of production and for better methods of production.

The apprentice training program was presented by Harold S. Falk, Falk Corp., Milwaukee, chairman of the S.F.S.A. committee.

A program of cooperative advertising and research was indorsed in principle by the convention. Other committee reports included those from the job cost group, the special committee on operating data reports, and the technical and specifications committee.

F. A. Lorenz, American Steel Foundries, Chicago, president of the society, discussed the present status of the industry. Other speakers included C. M. White, Republic Steel Corp., Cleveland, Russell Weisman, Cleveland *Plain Dealer*, and Whiting Williams, Cleveland industrial consultant.

Gear Makers Change Meeting Date

THE twenty-second annual meeting of the American Gear Manufacturers Association will be held at the General Brock Hotel, Niagara Falls, Canada, April 25-27, instead of April 18-20 as previously announced.

Papers and addresses will include: "Gear Sounds," by R. S. Drummond, National Broach & Machine Co.; "Conjugate Tooth Forms," by W. P. Schmitter, Falk Corp.; "Non-Metallic Gear Materials," by H. R. Moyer, Westinghouse Micarta Works; "Chain and Sprocket Drives," by J. S. Watson, Link-Belt Co.; "Ball Bearing Design for Modern Heavy Duty," by Thomas Barish, Marling Rockwell Corp.; "Lubricating Oils," by a representative of the Standard Oil Co.; "Characteristics of General-Purpose Motors," by I. Koenig, Reliance Electric & Engineering Co.; and "Welding," by H. S. Card, National Electrical Manufacturers Association.

Also, "Practical Problems in Handling Men," by F. H. Fowler, Foote Brothers Gear & Machine Co.; "Rates of Depreciation," by H. N. Mathias, Westinghouse Electric & Mfg. Co., and "Industrial Photography," by J. L. Boon, Eastman Kodak Co.

J. C. McQuiston, Penn Lincoln Hotel, Wilkinsburg, Pa., is manager-secretary of the association.

Current Metal Working Activity

Latest Data Assembled by THE IRON AGE from Recognized Sources.

	January 1938	December 1937	January 1937	Twelve Months 1936	Twelve Months 1937
Steel Ingots: (gross tons)					
Monthly output[a]	1,732,266	1,472,241	4,724,894	46,807,780	49,507,766
Average weekly output[a]	391,031	333,086	1,066,567	895,329	949,516
Per cent of capacity[a]	29.14	25.36	81.43	68.36	72.39
Pig Iron: (gross tons)					
Monthly output[b]	1,429,085	1,490,324	3,211,500	30,618,797	36,611,317
Raw Materials:					
Coke output[c] (net tons)	2,879,574	2,996,525	4,629,532	46,275,200	52,362,098
Lake ore consumed[d] (gross tons)	1,923,056	1,916,588	4,694,312	44,639,318	53,996,076
Castings: (net tons)					
Malleable, production[e]	.....	27,784	53,638	571,696	602,278
Malleable, orders[e]	.....	19,753	54,070	576,334	549,972
Steel, production[e]	.....	41,537	89,782	805,691	1,019,896
Steel, orders[e]	.....	27,024	115,150	909,080	877,459
Finished Steel: (net tons)					
Trackwork shipments[a]	3,135	3,804	7,246	68,813	92,121
Fabricated shape orders[f]	71,619	99,070	153,806	1,609,016	1,628,641
Fabricated shape shipments[f]	86,421	108,396	99,934	1,660,570	1,548,205
Fabricated plate orders[e]	.....	27,463	41,419	484,036	428,884
U. S. Steel Corp. shipments[g]	518,322	489,070	1,149,918	10,784,273	12,825,467
Ohio River steel shipments[h]	73,250	67,875	96,400	1,169,321	1,305,870
Fabricated Products:					
Automobile production[i]	228,074	346,886	399,638	4,616,857	5,016,565
Construction contracts[j]	$195,472‡	$209,452‡	$242,719‡	$2,675,296‡	$2,913,060‡
Steel barrels shipped[e]	.....	644,287	919,290	8,600,493	9,869,212
Steel furniture shipments[e]	.....	$2,125‡	$2,271‡	$19,246‡	$26,973‡
Steel boiler orders[e] (sq. ft.)	.....	546,615	654,159	11,511,557	9,923,457
Locomotives ordered[k]	9	77	46	533	368
Freight cars ordered[k]	25	3,287	10,881	68,341	52,788
Machine tool index[l]	118.4	142.7	200.3	201.7†	129.6†
Foundry equipment index[m]	76.8	111.2	190.9	219.3†	106.5†
Non-Ferrous Metals: (net tons)					
Lead shipments[n]	34,923	34,020	45,718	513,361	575,933
Lead stocks[n]	133,401	129,131	169,776	.....	.....
Zinc shipments[o]	24,931	29,545	51,227	561,969	570,111
Zinc stocks[o]	88,532	64,776	33,775	.....	.....
Tin deliveries[p] (gross tons)	5,550	5,020	7,615	74,005	83,665
Refined copper deliveries[q]	30,705	22,788*	86,791	819,007	865,893*
Refined copper stocks[q]	299,133	259,908	142,374	.....	.....
Exports: (gross tons)					
Total iron and steel[r]	.....	626,418	201,511	3,157,341	7,567,884
All rolled steel[r]	.....	259,113	110,139	1,167,244	2,597,083
Finished steel[r]	.....	191,442	103,495	1,040,815	2,125,157
Scrap[r]	.....	319,016	68,884	1,877,136	4,039,143
Imports: (gross tons)					
Total iron and steel[r]	.....	25,792	43,063	666,728	533,160
Pig iron[r]	.....	9,128	12,434	165,909	111,697
All rolled steel[r]	.....	14,475	24,409	270,594	284,571
British Production: (gross tons)					
Pig iron[s]	761,100	783,800	650,700	7,681,600	8,495,200
Steel Ingots[s]	1,081,400	1,103,800	998,900	11,699,000	12,964,000

†Three months' average. ‡000 omitted. *Revised.

Source of data: [a] American Iron and Steel Institute; [b] THE IRON AGE; [c] Bureau of Mines; [d] Lake Superior Iron Ore Association; [e] Bureau of the Census; [f] American Institute of Steel Construction; [g] United States Steel Corp.; [h] United States Engineer, Pittsburgh; [i] Preliminary figures from Automobile Manufacturers Association—Final figures from Bureau of the Census. [j] U. S. and Canada; [j] F. W. Dodge Corp.—37 Eastern states; [k] *Railway Age;* [l] National Machine Tool Builders Association; [m] Foundry Equipment Manufacturers Association; [n] American Bureau of Metal Statistics; [o] American Zinc Institute, Inc.; [p] New York Commodity Exchange, Inc.; [q] Copper Institute; [r] Department of Commerce; [s] British Iron and Steel Federation.

Capital Goods Activity Off 2.4 Points

THE IRON AGE Weekly Index of Capital Goods Activity

(1925-27 = 100)

	Week Ended Feb. 26	Week Ended Feb. 19	Comparable Week 1937	Comparable Week 1929
Steel ingot production	38.4	39.2	108.9	119.3
Automobile production	58.3	61.4	118.8	123.8
Construction contracts	69.8	74.5	78.6	134.6
Forest products carloadings	49.2	50.3	68.0	120.6
Production and shipments, Pittsburgh District	51.5	53.4*	110.8	117.0
Combined index	53.4	55.8*	97.0	123.1

*Revised.

EVIDENCE that the anticipated spring recovery is not as yet under way was indicated by THE IRON AGE seasonally adjusted index of capital goods activity, which declined to 53.4 for the week ended Feb. 26, the lowest level reached by the index since the first week of May, 1935. The present position of the index is 2.4 points below the preceding week and 1.3 points below the first week of the year. Losses in every component of the index, ranging from 0.8 points in the steel production series to 4.7 points in the construction series, accounted for the week's drop which was the heaviest movement of the index since the 3.6 points decline in the second week of the year.

Contrary to expectations, automobile assemblies were lower than the previous week, the week's total of 56,677 units being 2423 less than the preceding week. Assemblies a year ago were 115,360 units. The recession in the construction index interrupted five weeks of steady advancement, but this component remains the strongest of the entire index and is sill 7.6 points above its level at the beginning of the present year. The week's total of heavy engineering awards was $40,161,000, a drop of $4,840,000 from the preceding week's figure and $31,567,000 below the corresponding week in 1937. The volume of a year ago was, however, abnormally large and the total reported for the week of Feb. 26 compares favorably with the average week of a corresponding period a year ago. The heaviest award reported involved $6,000,000 for paving various streets in Chicago, a WPA project, while the second largest covered the elimination of a grade crossing at Lynbrook, N. Y., at a cost of $1,600,000.

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Ward's Automotive Reports; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from *Engineering News-Record*.

. . . . THIS WEEK ON THE

. . . Auto industry fortified for spring drive to end recession.

o o o

. . . Every manufacturer participates in National Used Car Exchange Week.

o o o

. . . Production off for last week, but orders are piling up.

o o o

. . . Chrysler passes dividend and G.M. cuts salaries for office workers.

DETROIT.—Apparently fortifying itself for a spring drive against the recession, the automobile industry is obviously preparing to cut prices and go after new business with all the facilities at its command. Along the automotive front the recovery effort will be a concerted one.

Probably on Thursday of this week there will appear the first of a series of newspaper and radio advertisements designed to break the used car jam. The seriousness of the thinking behind this used car campaign is indicated by the fact that Ford Motor Co., for the first time on record, has joined with all the other automobile manufacturers in a program. Manufacturers have contributed a million and a quarter dollars for this cooperative effort, which was announced in a press release Monday by Alvan Macauley, of Packard Motor Co. The campaign will be known as "National Used Car Exchange Week." It is scheduled to start March 5 and continue through March 12. It is an outgrowth of recent conferences at the White House between President Roosevelt and leaders of the industry.

Timed at the outset of the spring selling season, the drive is aimed primarily at stimulating the disposal of used car stocks now in dealers' hands to aid in the ultimate job of selling new cars and improving manufacturing schedules. Used car reconditioning schools will be staged by almost all of the manufacturers to acquaint their dealers and garages with the methods of making the second-hand cars more presentable to buyers.

An Industry-Wide Problem

This is finally a recognition that the used car problem is industry-wide and cannot be left in the hands of a dealer or distributer. Another indication is the fact that General Motors Corp. has turned its customers research staff on the problem. With a long record of successful and fruitful investigations, this research group has launched a questionnaire intended to help put the used car business on a more substantial basis. "The reconditioning, selling and servicing of used cars has become one of America's biggest industries," a Customer Research publication declares.

A typical indication of the industry's prospects for a good spring selling season and greater production exists at Plymouth, hardest hit of the auto companies during the fall and winter. Although still operating only three days a week, the Plymouth factory in recent weeks has had enough orders booked to warrant four-day-a-week production, but has held back until the orders bank up high enough to assure steady full-time operation a little later in the spring.

In the long run, this will benefit not only the factory, but the workers who will be called back to steady five-day-a-week work probably within a few weeks. Operation rates have been speeded in numerous cases. Buick, for instance, reports greater production although continuing on a four-day basis. Dodge reports, "orders up; rates speeded on three days." The only reduction of importance in the last week is at some Ford branches and the Lincoln plant, but this is not regarded as a serious matter because Ford has been operating at about 20,000 cars a week for several months and is just getting its second wind for the spring selling season.

Normal Advance Forecast

Production in the industry is on the verge of a normal seasonal advance, according to Ward's Automotive Reports, which estimated last week's production at 56,677 cars and trucks, a decline from the previous week's total of 59,100, mostly attributable to the decrease at Ford. This compares with the 1937 total for the corresponding week, 115,360. While Ford total output dropped from 18,500 to 15,000, Chevrolet continued at 15,000 cars per week and Plymouth continued at 4500. Increases were reported at Nash, which went on four days a week production and stepped up from about 750 cars to more than 1150 cars. Hudson had a slight increase, going from about 900 to approximately 950. In the Chrysler group, the Dodge output gained 200 to 3600, the Chrysler division 1200 to 1300, and DeSoto 800 to 950. Packard found itself able in the last week to run to five days a week instead of the curtailed three- and four-day schedule it had been following.

Buick continues building up its retail sales volume, with the second 10 days of February more than double the volume for the corresponding period a year ago. The company reports that 3169 retail deliveries were made, compared with 1518 in the corresponding period in 1937. It was also a decided increase from the 2860 in the first 10 days of the month. W. F. Hufstader, general sales manager, said that this volume indicates that Buick will have its best February since 1928. For the first three weeks of February, Dodge sales have increased 84.8 per cent over a similar period in January. Another General Motors unit report-

ASSEMBLY LINE . . . .

By W. F. SHERMAN
Detroit Editor

ing outstanding gains is Pontiac, which in used cars alone sold 8602 in the first 10 days of February, which is 1675 more than in the same period of January.

Prices Due for Cut

General Motors' announcement of salary cuts of 10 to 30 per cent for 40,000 office workers is seen in the industry as the final adjustment on costs before new car prices are slashed. The 10 per cent reduction affects all salaried employees receiving up to $10,000 annually. Executives receiving more than $10,000 will receive an additional cut of 20 per cent on the excess above $10,000 and up to $50,000. Those getting above $50,000 must suffer an additional reduction of 30 per cent on the excess over $50,000 annually.

It was estimated that the salary reduction would reduce General Motors' expenses about $7,500,000 annually. So far most of the automobile companies have had salary reductions in effect through the shorter work week. It will be considered a natural step if they now follow with direct salary reductions but return the office employees to their five-day week schedule at the same time that plants resume near-normal production.

Last week Chrysler Corp. directors failed to take action on a common dividend usually declared at this time of year. In December a dividend of $3 was paid and at this time last year a common share dividend of $1.50 was declared, with other payments of $2 in June and $3.50 in September. The omission of a quarterly dividend this time was the first since 1935. In making the announcement, B. E. Hutchinson, chairman of the finance committee, noted that the company had paid $22 a share from earnings in the last two years, aggregating $25.91 a share. He attributed the high dividends to the existence of the undistributed profits tax on earnings retained in the business.

Latest figures on employment and payrolls in Michigan manufacturing industries show a decline of 31.8 per cent from December through January. Compared to January, 1937, payrolls are 38.5 per cent lower. In the first month of the year the number of employees decreased 21.7 per cent. For the transportation industries alone, which include all the automobile and parts plants, the payroll reduction in January amounted to 32.8 per cent and was 41.2 per cent less than a year ago January.

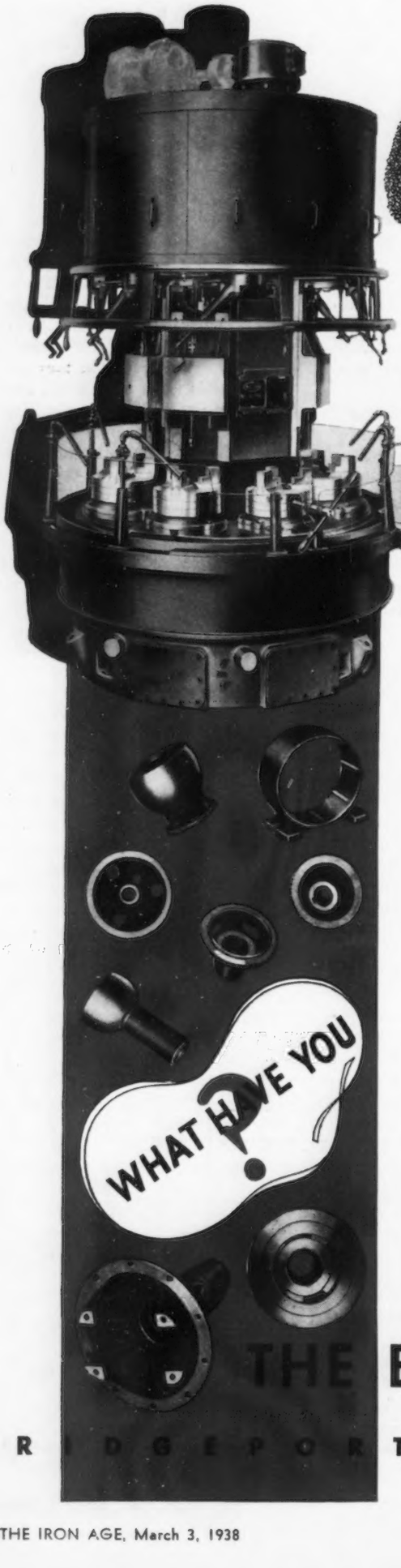
Along with the resumption of many WPA projects, the welfare load in Detroit has shown a sharp decrease. A particularly hopeful sign is a sharp drop in the number of applications for aid. The change occurred about the middle of the month, as indicated by the figures for Feb. 14, when 1589 applications were received by the Welfare Department, as compared with only 997 received on Feb. 18.

600 in Sit-Down

A sit-down strike, first of the variety seen in this vicinity in many months, occurred last Wednesday in the Essex Wire Co. plant in Highland Park. Six hundred employees occupied the plant until Friday night, then departed after the company and union officials agreed to meet on Monday this week to discuss differences. The strike was called to protest removal of machinery to a plant at Fort Wayne, Ind., according to the strikers. Another minor dispute last Thursday caused closing of one department at the Packard Motor Car Co. The closing order was given by company officials when workers in the trim assembly department threatened to strike unless assured that they would win demands for a more strict seniority system and a different handling of lay-offs. The department was to resume Monday morning after negotiations of the grievance between company officials and the UAW.

In these minor disputes there is seen little threat of serious outbreak because in most cases the incidents represent principally an attempt of minor union officials to keep group interest stirred up. The greater part of UAW interest at present is concentrated on elections for officers of local unions. Balloting took place in the last week at the local which includes employees at parts plants and jobbing shops; an election was held at the L. A. Young Spring & Wire Co., and others were scheduled for numerous plants.

Officials of nine Detroit sheet metal shops were invited last week to attend a banquet given by members of the Sheet Metal Workers Union, a division of the SWOC. According to the



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PROVIDE FOR ACCURACY, LONG LIFE, AND RELIABILITY IN YOUR PRODUCT AT LOW MANUFACTURING COST.

How about the price paid for inaccuracies in machining? Yes, what about those spoilage costs?

If it is a fact that such cases do occur, then it must be admitted that the condition is not conducive to the Lowest manufacturing costs possible of attainment.

Right off the bat then: Reliability to maintain Accuracy for an entire short run of work or for Long periods of volume production is an acknowledged credit to Bullard Mult-Au-Matic Performance.

And Mult-Au-Matic Performance is not talked of in terms of one year or two years, but in periods of MANY years.

Why? Well, because Accuracy and Reliability are designed and built into these Bullard Manufacturing Units. These are well-known facts.

That's why users of Mult-Au-Matics invariably specify these machines for replacement or expansion equipment.

Whatever your turning job may be, "It Can Be Done" at low cost the Mult-Au-Matic way.

Send samples, prints, or sketches, and let us submit facts and figures for your analysis and comparison.

THE BULLARD COMPANY

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Union's president, the celebration was being staged to mark the completion of a year's congenial relations and to create more good will between the employer and employees. Following the dinner, motion pictures were presented and a number of union officers and the heads of each firm were allotted five minutes each for speech making.

A legal interpretation that may prove far-reaching was handed down by the Michigan Supreme Court in a case involving the Brotherhood of Railway & Steel Clerks, Freight Handlers and Station Employees. Mrs. Martha O. Hartley, who lost her job with the Grand Trunk Railroad in 1932, sought damages from the union, charging that her dismissal came after the union consented to the dismissal of married women, an impairment, she said, of her seniority rights under an earlier contract. In effect, the court ruled that a union might create seniority rights by collective bargaining and might also modify or destroy those rights.

A Dearborn, Mich., judge has under advisement a test case designed to try out the traffic ordinance under which nearly 1000 members of the UAW have been arrested while distributing literature to Ford workers on Miller Road, alongside the Rouge plant. Arguments were concluded last week.

Westinghouse President Sees Better Business Ahead

PITTSBURGH.—Based on inquiries for equipment and the slight improvement in incoming orders during the past few weeks, the prospects of a moderate business improvement during the next few months are evident, according to George H. Bucher, newly elected president, Westinghouse Electric & Mfg. Co.

The volume of Westinghouse's domestic business declined rapidly during the latter half of 1937, then flattened out on a level plane early this year, but foreign business, Mr. Bucher said, still shows promise and is holding close to the high levels of last year.

Part of Westinghouse's unfilled business is comprised of heavy equipment orders on which delivery has been deferred by public utility companies. Shipping instructions on this equipment will probably await a clarification of the entire public utility question.

THE use of inland waterways for transportation of motor cars has resulted in the conversion of coal barges into motor car carriers. Dravo Corp., Pittsburgh, has built two such carriers for Union Barge Lines, each of which has room for 81 automobiles on its three steel tiers. Central sections of the top and middle tier are removed for loading and about 5½ hr. are required to completely load each barge. Patent has been applied for covering the conversion design.

OUT OUR WAY — BY J. R. WILLIAMS

MECHANIC'S TAN

THIS WEEK IN WASHINGTON

. . . Hearings on scrap export licensing begin April 5; shipments have declined recently.

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. . . New investigations are begun in Capital; prices, cost of living, labor espionage and Federal licensing of corporations among subjects.

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. . . Little business organizes a federation and opens Washington offices; to demand protection of its interests from Congress.

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By L. W. MOFFETT

Resident Washington Editor
The Iron Age

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WASHINGTON. — Resumption of hearings on April 5 before the Thomas Senate Military Affairs subcommittee on proposed scrap licensing legislation has directed attention to the much-decreased volume, with a simultaneous higher quality, of old material now being exported. It is also clear that there is decreased interest in the proposed legislation.

While scrap exports still are substantial, they began a sharp decline about three months ago, due largely to the fact that importing countries, notably Japan, apparently had accumulated heavy stocks. However, Japan has recently resumed American purchases in somewhat greater quantities, though not to the proportions attained last spring.

Meanwhile, the domestic steel industry has suffered a sharp drop in operations, with the result that instead of pressing for scrap supplies as it did when operating at a high rate, its demands are exceptionally light and the market is weak.

During periods when the domestic steel industry is operating above normal there is good or strong scrap demand, particularly for No. 1 heavy melting steel. At such times relatively small quantities of this preferred grade are exported. But when the home industry is depressed, as it now is, and scrap of any kind is a drug on the market, foreign buyers can be more particular in grades which they purchase. Hence, the classifications for export vary as conditions change. The upshot is that for the past three months the proportion of No. 1 heavy melting scrap exported has risen. In the periods when little No. 1 heavy melting is available, the grades allowed to be classified as No. 1 and No. 2 heavy melting cover a much broader field than the more rigid American specifications.

Some Scrap of Little Value in This Country

During the last few years there has been an increasing amount of material exported which is of little or no value in this country, except in times of emergency and extremely high prices of scrap. A very large share of the old automobile bodies which have disappeared from thousands of the country's automobile graveyards during these past two years have found their way into export in the form of No. 2 bundles. This classification, at any time, has little or no market value in this country. Few melters, for any purpose, will buy it for domestic use when anything else is available. But where the labor is cheap enough to permit separating out the bundles and reclassifying the material—as, for instance, in Japan—good use seems to be found for this type of material. That and the No. 2 cast, which has been exported to the extent of perhaps 500,000 tons during the past two years, has really been clear gain as far as this country is concerned, because it would not have found any market at all here. And the collection of this type of scrap has given employment to many people who would otherwise have been dependent upon relief for their living.

Therefore, in any consideration of curtailment of scrap exports, sources opposed to licensing point out that careful attention should be given to the fact that scrap in reality is not just scrap but, as exported, consists of four general classifications. First, No. 1 heavy melting grade, which is in real demand and of real use to the American steel industry and domestic foundries in this country. Of this grade the United States exported perhaps 5 per cent of the total domestic consumption. Second, No. 2 heavy melting, which as an export classification is somewhat more loosely construed than as a domestic classification, and includes considerable amounts, perhaps up to 50 per cent, of material which would not ordi-

narily be purchased by either the American steel industry or domestic foundries. Third, No. 2 cast and fourth, No. 2 bundles, neither of which latter classifications are ordinarily salable in this country at prices giving a reasonable return for the labor involved in collecting.

A New Flood of Governmental Investigations

THE investigation of the steel scrap situation, however, is small spuds in the welter of investigations, reports, studies, surveys, inquiries, conferences, and screw-tinies that rage and threaten in Washington, taking on the proportions of an epidemic. Not that snooping expeditions haven't prevailed like a malignant rash through the past five years of brain-trust staged opera bouffe, with its quaint characters of crusaders, including the politically ambitious. But when charted the line on these manifestations does have its ups and downs, though at no time has it ever scored an index number below 1000, when scaled against 100 for 1926. The curve took a sharp upswing the past week. Everybody seems to want to investigate everything. No difference that scores of "investigations" are already swamping business with demands to fill out elaborate questionnaires, submit tons of document and statistical material, ancient, medieval and modern, on most every subject under the sun. More and more demands or threatened demands are made, regardless of whether they duplicate activities in the labyrinth of Washington alphabetical agencies or Congressional committees.

Under way or proposed are:

President Roosevelt has ordered his "price committee" to continue its study because, he said, he wants "more information." The committee was responsible for the recent exhaustive report on "balanced prices" which, with charts, set back of the Presidential desk, was made the object of a prolonged lecture by Mr. Roosevelt on "economics" before a large and weary class of newspaper correspondents.

The "more information" supposedly will deal with so-called "monopolistic prices" about which the Administration has harped so much. Many think it will end mostly in talk, though it is expected to submit an anti-trust message to Congress soon but with no draft of legislation before the next session. The Administration may surprise those who think it won't act against prices it thinks are too high. Nevertheless, those sharing this view base it realistically on the fact that organized labor has rather pointedly served notice on the White House to lay off price reductions. Obviously because labor thinks price reductions mean wage reductions.

The President was in conference for about an hour last Friday with Cyrus Eaton, Cleveland, who once attempted a merger of Youngstown Sheet & Tube Co. and Republic. The President said the discussion concerned general business, the condition of the railroads and steel.

At the Federal Trade Commission it was announced that it will have its exhaustive "cost of living" and "monopolistic practice" study in the hands of the President by April 1. Denying published reports which affected to set forth conclusions reached, it was stated that it is not yet known what the FTC findings will be. However, the daily press summary is viewed as a probably smart deduction, based no doubt on the policy of the FTC itself. The report said the FTC had found that "price fixing and monopolistic

practices" have increased the cost of living in many lines and that the Tydings-Miller resale price maintenance act had contributed materially to the increased cost of living. In making this study, which the President ordered on Nov. 16, it is reported that detailed inquiry is being made into practices of various industries, including steel. Steel companies have been bombarded with questionnaires, an important portion of which related to the basing point system, which is under perpetual FTC study. It is quite conceivable the FTC will make the findings indicated, along with a great array of others. The Presidential message is not expected to go to Congress until after the FTC fulmination. One thing it may be sure the FTC will omit—any blame on the New Deal policies for boosting the costs of living, yet they are more responsible than any combination of outside factors. The report, therefore, will be like staging Hamlet without Hamlet.

Investigation of Prices

A proposed price structure investigation, sweeping from Dan to Beersheba, was the occasion of a mild furore in the Senate possibly because its source, Senator Bailey of North Carolina, anti-New Deal Democrat, apparently was suspected of attempting to drag in New Deal legislation as a cause for price increases. Briefly the Senator's resolution, unanimously adopted by the Committee on Commerce, headed by Senator Copeland, of New York, another anti-New Deal Democrat, provides for a $25,000 appropriation for a 30-day inquiry by a Commerce subcommittee into the entire field of prices to determine whether there is a disparity as between prices paid for raw materials, prices for labor and prices charged the consumer. Costs, prices and profits throughout an all-embracing range of products—food, clothing, building materials, etc., together with power rates, rates of taxes "and perhaps other things" would be sought. Administration supporters, who suspected a "frame-up," looked askance at some of Senator Bailey's remarks, especially his observation that "I would like to know just how much of our present price structure is due to taxes. There has been a tremendous increase in taxes, and it is always reflected in the price to the consumer." The Senate objectors protested that a 30-day study could do no more than scratch the surface, that if the study were to be made it should be done by the FTC with an adequate appropriation at hand, many times the proposed $25,000, and that if a study were made it should cover the whole question of monopoly and competition, which actually the FTC is supposed to be studying. The protests were designed chiefly to kill off the Bailey inquiry, however.

Senator Bailey told THE IRON AGE that his proposed price inquiry is in line with the general agitation on the subject and cannot be construed as unsympathetic toward Administration efforts in that direction. The subcommittee, he said, expects to get full benefit of any data which the FTC has compiled in its price study, although he hopes the information gathered by the Senate committee will be "more current" than that which is expected eventually to come from the Trade Commission. The President's committee on prices, which sent a report to the White House recently calling for "a balanced system of prices," will also be consulted, the Senator explained. He described the

contemplated inquiry as "an economic study to find the facts."

Charles R. Hook to Appear

Shifting over to the querulous La-Follette Senate Civil Liberties Committee, CIO alter ego, it is found resuming its unending political buzzing into "labor espionage" and what have you. Among additional witnesses summoned is Charles R. Hook as president of the National Association of Manufacturers, and not as president of the American Rolling Mill Co.

Other officers of the National Association of Manufacturers who will appear before the committee include Chairman Ernest T. Weir of the National Steel Corp. Testimony of officers of the association began on Wednesday of the present week, and relates to the association's activities regarding industrial relations.

Starting next Monday members of the special conference committee, made up of industrial relations directors of 12 corporations, will be called before the committee. Included in this list of witnesses is J. M. Larkin, chairman of the committee and vice-president of the Bethlehem Steel Co. Later the committee will question members of the Johnstown, Pa., citizens committee and associated organizations which were active in connection with the so-called "Little Steel" strike last summer.

On Tuesday hearings were begun before the Senate Judiciary Committee on the revised O'Mahoney-Borah Federal Licensing Bill. Strong opposition from business interests. As revised the bill exempts corporations having assets of less than $100,000.

Also on Tuesday the House Committee on Merchant Marine and Fisheries began executive hearings on shipbuilding costs, summoning shipbuilders. This is an offshoot of Maritime Commission complaints, echoed by the White House, of so-called high bids for ship construction.

Outside of official circles comes a request on the Federal Government to set up still another bureau, "a central consumer agency" on behalf of the real forgotten man, the unorganized group, beset on all sides by organized groups. An oar was put in by the Consumers' National Federation for poor old John Q. Consumer. The federation called on the Great White Father at the White House and urged an agency to give all consumers equal status with labor, business and agriculture. The federation, more or less militantly, is headed by Miss Helen Hall, and in a statement declared that the "bargaining positions of labor, of farmers and of capital are strengthened by organization and by legislation" and that the "growing complexity of our economic life leaves the consumer in a progressively worse bargaining position." The federation wants the central agency to initiate proceedings for the definition of standards of consumer goods, collect and publish information of value to consumers, represent consumers before regulatory bodies, and cooperate with an advisory interdepartmental committee for coordination and extension of consumer services now being performed in Government departments." Sweet sounding. But consumer agencies in the Government have been as futile as the League of Nations and always will be so long as the consumer remains apathetic to important issues which he thinks do not directly affect his own pocketbook. Hidden taxes hit pocketbook mightily, but he seems strangely unaware

of or indifferent to the fact. Yet the consumer agency may be set up. The New Deal has set up a multiplicity of agencies for much less justified provocation.

Little Business Organizes

Without appealing to the White House, something quite unusual in these days of Federal Government dependence, little business has taken the bit in its teeth and organized its own group. One member bluntly says it is a lobby, prepared to demand protection of Congress. Known as the American Federation of Little Business, "non-partisan and without connection with any other group," with "substantial connections in more than 20 states" the group has established national headquarters in the Heurich Building, 1627 K Street, N. W., Washington, all set to institute a nation-wide organization campaign. Inspired to organization by reason of the recent little business conference and the advice of Senator Borah to get together a statement issued by the Federation said "the need for the organization of little business is almost too obvious for words of justification." Taking the same slant as that of the consumer group the statement added that "the little business man remains alone and unprotected in the absence of such an organization. Capital and big business are organized above him, while labor and even agriculture to an increasing extent are organized below him." "Little business" as a matter of fact already is a strong force with Congress but if really organized it will be much stronger.

Otherwise, all is NOT quiet on the Potomac.

Lumber Industry Borrows From FHA for Small Homes

WASHINGTON.— Introducing to America the "perfect small home," the retail lumber industry has obtained from the Federal Housing Administration the first mortgage insurance commitment under the revised National Housing Act, for the construction of a five-room demonstration dwelling in nearby Arlington County, Va. Months in the planning, the home will be the first in a nationwide small homes campaign sponsored by the 20,000 retail lumber merchants who are members of the National Retail Lumber Dealers Association. It is planned to duplicate the home in hundreds of communities throughout the country.

Wage-Hour Bill May Be Pushed For Passage at This Session

WASHINGTON. — With the New Deal's ever-normal granary farm program on the statute books, Administration strategists are quietly laying plans to push a revised wage-and-hour bill through Congress in an effort to round out the four-point legislative program laid down by President Roosevelt when he called an extraordinary session of Congress last October.

The new farm relief law which, critics charge, was written by top-soil thinkers on Capitol Hill and in New Deal councils, is the first Administration measure of the four-point program to be given Congressional approval despite the four months Con-

gress has been in session since the President proposed his list of "must" legislation.

The stumbling-block to successful passage of a wage-hour bill is still the House Rules Committee, which blocked Administration efforts last session by refusing to give the right-of-way to the Senate-approved draft. But Mary T. Norton, chairman of the House Labor Committee and spearhead of the Administration's wage-hour efforts for the past six months, has been given instructions from the White House to push for passage and her committee is trying to iron out differences in an effort to make the new bill less vulnerable to House criticism.

One objective, it is understood, is to draft a bill which will be less objectionable to Southern Congressmen, who are militantly opposing any plan which does not provide for Southern differentials. Another is to remove broad powers of snooping and control from the hands of an administrative body to appease industrialists fearful of bureaucratic interference with their business. But sponsors are thereby placed in the position of pressing for enactment of a law that would, they feel, be vague, indefinite and generally ineffective.

There are a score of wage-hour proposals in the offing and Administration lieutenants are hoping to salvage less objectionable features and whip them into a program which meets with White House approval. Among the suggested plans is one sent to Congress last week by AFL President William Green, although its chances are admittedly slim because it provides for no geographical differentials.

Green Bill 40c., 40 hr.

Green's bill specifies a flat minimum wage of 40c. per hr. and a maximum work week of 40 hr. for what he describes as "oppressed and sweated industries." Administration would be under the Justice Department where violations would be prosecuted and fines set at $100 for each offense. While administrative machinery would be simple, the measure is even more rigid than the Senate draft which was bottled up in the House Rules Committee last session.

Mary Norton's committee has two other plans up for consideration, one of which would unmistakably revive the Blue Eagle days of 1934. A single, independent administrator would be named to make effective the wage and hour scales established under the NRA industrial codes although "standards" could be shifted 10 per cent up or down. The other plan adopts the old principle carried in the Senate version of the wage-hour bill by calling for minimum wages up to 40c. per hr. and a work week as short as 40 hr. a week. A single administrator under Madame Perkins' Department of Labor would function with the assistance of a nine-man advisory board. Both plans would include a far greater proportion of workers than was attempted under previous wage-hour proposals.

Representative Robert Ramspeck, Democrat, of Georgia, a member of the militant bloc which grounded the Administration measure several months ago, has a fourth compromise proposal. It would empower the FTC to rule as "an unfair trade practice" any attempt by one company to increase hours or reduce wages to give it a competitive advantage over another. A "cease and desist" order presumably would bring the recalcitrant company into line. Ramspeck says he

believes such a plan would pass his committee without much difficulty.

But any labor standards bill that gets House approval will be returned to conference for adjustment of differences with the Senate version, and Senator Thomas, chairman of the Senate Labor Committee, has indicated that he will vigorously oppose any plan which does not create an independent administrative board as proposed in the Senate draft. So despite Administration plans, the wage-hour muddle has reached a new high, and passage, which at one time appeared virtually certain, is more doubtful than ever.

Members of Congress who were formerly enthusiastic over the necessity of the legislation have had their ardor dampened by the recession and sentiment appears to be growing in favor of submitting the whole question to a joint commission for further study.

The Business Advisory Council recently suggested such a plan to the President but the White House has remained silent on the recommendation.

Minimum Coal Prices Suspended As Courts Grant Exemptions

WASHINGTON.—The National Bituminous Coal Commission, harassed repeatedly by court injunction during the two years of its hectic existence, has been forced by the latest court action to suspend minimum prices effective Feb. 25.

Already faced by price exemptions granted to specific groups of consumers through court injunctions, the last straw came when the Federal Court of Appeals in the District of Columbia granted minimum price exemption to the Associated Industries of New York.

Judge Harold M. Stephen, a New Deal appointee, listed all the association's members in the order including the Bethlehem Steel Co., Republic Steel Corp., General Electric Co., Westinghouse Electric & Mfg. Co., General Motors Corp., International Business Machines Co., International Harvester Co., Inc., Art Metal Construction Co. and more than 1400 other companies, many of which have plants scattered throughout the country.

In this case, as in the price suspension order won by the Association of American Railroads, the court ruled that the commission fixed minimum prices illegally since it failed to conduct public hearings before prices became effective. Similar relief had also been given the city of Cleveland and the Indiana Gas & Chemical Corp., of Terre Haute, Ind.

At first reluctant to drop price schedules over which it had labored for eight months, the commission was jolted into action by John L. Lewis, United Mine Workers president, and scores of coal producers who were fearful of a general price collapse. It announced that prices would be revoked since "advantages in the buying of coal have been conferred upon certain railroads and other public utilities as well as upon numerous other large consumers."

Industry To Make Own Prices

Estimates vary, but some authorities forecast that substitute price schedules cannot be whipped into shape inside of five months and that internal dissension and patronage dis-

putes are again expected to be a retarding factor. Other difficulties which some contend are almost insurmountable include agreements among producers within marketing areas covering proposed minima. Lack of agreement was responsible for the commission's proceeding before without public hearings, the Government's coal stabilizing agency saying, in effect, that minimum prices were being proposed by the commission since producers were unable to agree among themselves.

But the courts ruled otherwise and the commission's price schedules of two months' duration were thrown out the window and maladministration was chalked up against the agency whose original life-giving law was outlawed as unconstitutional by the Supreme Court.

Meanwhile, the bituminous coal industry and its consumers will make their own prices as they have done for years without the assistance of Governmental price-fixing efforts.

Todd to Represent Steel Exporters In Europe

WILLIAM B. TODD, former vice-president in charge of sales of the Jones & Laughlin Steel Corp., Pittsburgh, will sail on March 9 for London, where he will represent the Steel Export Association of America. He will be accompanied by John Outwater, who has represented the Steel Export Association abroad for some years. After acquainting Mr. Todd with steel affairs in Europe, Mr. Outwater will return to this country to become associated with the New York office of the Steel Export Association in an executive capacity.

W. B. TODD

The appointment of Mr. Todd comes as a result of the recent conferences in New York between the Steel Export Association and representatives of the International Steel Cartel of Europe. While he has not previously been closely associated with steel export trade, he has a wide acquaintance with the domestic steel situation in this country. Prior to his connection with Jones & Laughlin, he was for many years with the Union Drawn Steel Co., now a subsidiary of the Republic Steel Corp.

It is understood that the European mills may send a representative to this country to further the working out of the broadened cooperation in world export trade between the United States and Europe.

Labor Board Gets $2,955,000 Despite Senatorial Protests

WASHINGTON. — Appropriation of $2,955,000 for the National Labor Relations Board to speed up its procedure for the next fiscal year was voted by the Senate last week over the protests of Senator Glass, Appropriation Committee chairman, and Senator Burke, Democrat, of Nebraska. The amount represents an increase of $385,000 over funds made available for Labor Board expenditures during the current fiscal year.

At the same time the Senate followed the recommendations of its appropriations committee and voted to pare funds for seven other agencies ranging from a $500,000 reduction below the figure recommended by the House committee for the ICC to a $13,000 decrease for the Rural Electrification Administration. But the Labor Board came through with flying colors.

A National Disgrace

Glass led the unsuccessful fight for economy in Labor Board expenditures, pointing out that "some of us did not want the board to extend its tentacles into every community in the United States." He was backed by Burke, who tried unsuccessfully several weeks ago to put Labor Board activities under the scrutiny of the Senate Judiciary Committee. Burke told the Senate the board's operations had been a "national disgrace."

Senator Thomas, chairman of the Senate Labor Committee, and Senator Wagner, co-author of the labor relations act, defended the board's operations. Wagner warned that "insufficient funds might cause continuation of labor disputes and delays in their orderly adjustment." He held that criticism of the board was largely attributable to the fact that it is difficult "to render a decision satisfactory to both sides in a dispute."

Should the Board Be Abolished?

"The committee thought," Glass explained, "that until the Labor Board had established its usefulness, or its viciousness, as the case may be, we should not increase its appropriation this year by nearly $400,000 above the amount the board had last year.

"Some of us believe the board ought to be abolished, but we gave it the same amount of money it had last year and we think the board ought to be content with that amount."

The board, however, had previously indicated that it's bare necessities called for the increase which would be spent largely for personnel additions. The board said some 200-odd lawyers would be needed to speed up its cases.

Warren, Ohio, Company Gets Transformer Order

CLEVELAND.—Standard Transformer Co., Warren, Ohio, has been awarded the contract for building 1385 distribution transformers for the All American Canal Power System in California, a rural electrification project.

...OBITUARY...

ANTHONY J. HILDENBRAND, purchasing agent of the Cincinnati Milling Machine Co., died Sunday at Cincinnati following a short illness. He was 41 years old. Widely known in business circles, Mr. Hildenbrand had been affiliated with the Milling Machine company for 26 years. He had been purchasing agent since 1919. In last year's flood Mr. Hildenbrand organized a relief station at the Milling Machine company, where more than 200 refugees were cared for under his supervision.

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HUGH LESLEY, manager operating department, Electric Storage Battery Co., Philadelphia, died on Feb. 10, at his home in Germantown, Philadelphia. He was 71 years old. Mr. Lesley attended Penn Charter School and was graduated from Haverford College in 1887. He was associated with Storage Battery company for 43 years. He was a member of the Engineers Club and of the Franklin Institute.

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FRANK K. BUCHANAN, open-hearth superintendent of Edgewater Steel Co., Oakmont, Pa., died Feb. 10 at his home in Oakmont. He had been in the employ of the Edgewater Steel Co. since 1918, prior to which time he worked for the Andrews Steel Co. at Newport, Ky. He was 57 years old.

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WILLIAM AMBROSE HENDERSON, pioneer automobile designer, died Feb. 24 in Detroit on his 60th birthday anniversary. Born at Providence, R. I., his first professional work was the designing of carriages, but he entered the automobile industry when it was still in its infancy. He had designed carriages for President McKinley, Mark Hanna, Mrs. Grover Cleveland, Mrs. George M. Pullman, Prince Henry of Prussia and the Ecuadorean government. For many years he was chief stylist for Holbrook & Co., body manufacturers in New York City. Later he was president of Brook, Austrock & Henderson, custom body builders in New York. He then became chief designer for the old Dort Motor Car Co. and also was manager of the body plant. For the last three years he had been

HUGH LESLEY

with the Auburn Motor Car Co. at Connersville, Ind.

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GUSTAV A. MERKT, manager combustion control department, of the Morgan Construction Co., Worcester, Mass., died on Feb. 20. For many years he had been associated with the steel industry, having held engineering positions with the American Steel & Wire Co. and the Wickwire Spencer Steel Corp. In 1925 he joined the staff of the Morgan Construction Co. as a consultant, and later succeeded the late George H. Isley as manager of the combustion control department. He was an active member of the American Society of Mechanical Engineers.

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EDWARD DANA SHAW, vice-president, Decker-Reichert Steel Co., Cleveland, died Feb. 23 following a short illness, at the age of 62 years. Mr. Shaw formerly was associated with Morse-Rogers Steel Co., Cleveland.

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AUGUST J. (GUY) AMEEL died Feb. 19 in Detroit. Mr. Ameel was general foreman of the final assembly line at Dodge Brothers. He drove the first and the four millionth cars off the line. He was 64 years old.

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E. R. FREDERICK, former Detroit resident and American representative of Citroen, French automobile manufacturer, died in New York City more than a week ago. Mr. Frederick, who was 54 years old, had been a mining engineer in Mexico for several years and then went to Paris. He won the French and Belgian Legion of Honor awards in the World War. He had lived in France 13 years.

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ERNEST F. KNOCH, an engineer with the Murray Body Corp., died Feb. 21 after a year's illness. He was born on March 20, 1863.

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HENRY A. WAGNER, sales manager until 1932 for bolt and nut products of the Bethlehem Steel Co., Bethlehem, Pa., died in St. Luke's Hospital in that city on Feb. 2, aged 71 years. In 1892 he entered the employ of the Pennsylvania Bolt & Nut Co. Seven years later when that company was acquired by the American Iron & Steel Co., he became sales manager, continuing in the capacity of sales manager for the bolt and nut products when that company was acquired by Bethlehem Steel Co.

PAUL H. DIVER, manager of magnet sales for the Ohio Electric Mfg. Co., Cleveland, died on Feb. 26. He had held that position since the organization of the company.

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CHARLES MCLEOD, traffic manager of Fisher Body Plant No. 1, Flint, Mich., died Feb. 25 in Hurley Hospital, Flint. He was 44 years old and had held the position of traffic manager at the Fisher plant since going to Flint from Highland Park, Mich., 11 years ago.

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JAMES J. MARTIN, of the Cadillac Motor Car Co. engineering department, died Feb. 24 in Detroit. Mr. Martin was born in Ireland 52 years ago and had lived in Detroit 30 years.

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JOHN H. DALLER, died Feb. 23 at his home in Detroit. From 1900 to

1936, he was associated with the E. T. Barnum Wire & Iron Works as secretary-treasurer and was engaged in architectural work fom that time until his death. He was born in Louisville, Ky., 62 years ago.

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CALEB N. MATHEWS, who had been identified with the J. B. Ford Sales Co. from 1910 to 1936, died at his home in Detroit on Feb. 19, aged 68 years. He represented the J. B. Ford Co. in Detroit for 16 years and Atlanta, Ga., for five years and also in Grand Rapids, Mich.

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THEODORE R. HARVEY, president, Beckley Perforating Co., Garwood, N. J., died on Feb. 1, aged 65 years.

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CHARLES DENBY, brother of the late Edwin Denby, secretary of the Navy, died Feb. 15 in Washington. He had been a vice-president of the Hupp Motor Car Corp. in Detroit, starting in March, 1915, after he had resigned as consul-general at Vienna. Mr. Denby was born in Evansville, Ind., and was graduated from Princeton University in 1882. In 1885, as second secretary of the legation in Peking, he started a diplomatic career in China, holding various offices until 1907, when he was appointed consul-general at Shanghai. He retired from active public life in 1919.

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HARRY C. FORD, production and shipping superintendent at Carnegie-Illinois Steel Corp.'s new Irvin works, died Feb. 26 at Pittsburgh. Mr. Ford had been associated with the U. S. Steel Corp. and its subsidiaries for more than 25 years. Prior to his appointment to the Irvin works he was assistant to the general superintendent of the company's New Castle plant. Before going to New Castle he had been associated with the American Sheet & Tin Plate Co. at Dover, Ohio, and Farrell, Pa. He was 47 years old.

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ROBERT WILSON LYNCH, retired veteran employee of Carnegie-Illinois Steel Corp., Pittsburgh, and its predecessor, Carnegie Steel Co., died at Daytona Beach, Fla., on Feb. 25. For the 40 years previous to his retirement on March 1, 1937, Mr. Lynch held responsible positions in the sales and order departments. He started his career in 1889. He was 68 years old.

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JACOB S. DISSTON, formerly vice-president of Henry Disston & Sons, Inc., Philadelphia, died at Belleview, Fla., on Feb. 28, aged 76 years. After attending the University of Pennsylvania, he joined the Disston company, which had been founded by his father. He soon became its treasurer and continued in that position until 1911, when he became vice-president. He was a member of the board for 35 years. Mr. Disston had been retired for some years.

Manning, Maxwell & Moore, Inc., Bridgeport, Conn., maker of valves, gages, safety valves, thermometers and control instruments, has appointed nine new general field salesmen. They are: Charlotte, N. C., Paul Hayden; Jacksonville, Fla., W. H. Kissam; New Orleans, La., R. F. Heath; Minneapolis, Minn., K. W. Johansson; Columbus, Ohio, W. S. Adams; New York City, V. W. Farris; Philadelphia, H. H. Jones; Chicago, H. B. Stallings, and Tulsa, Okla., C. W. Velie. R. W. Neel, who has represented Manning, Maxwell & Moore for a number of years, is new Southeastern district sales manager with headquarters in Atlanta. Malcolm Black has been made manager of the Southwestern district with headquarters in Tulsa.

FINANCIAL NOTES

Youngstown Sheet & Tube Co. has declared regular quarterly dividend of $1.37½ per share on its preferred shares, payable April 1 to preferred shareholders of record March 12.

Midland Steel Products Co., Cleveland, in its annual statement reports a net profit for 1937 of $2,320,811. This compared with $2,160,036 for 1936. Earnings per share of common stock for 1937 were $6.15. An allowance of $444,571 for depreciation and $597,768 for Federal taxes has been deducted, according to E. J. Kulas, president of the company.

Republic Steel Corp. has declared the regular dividend of $1.50 per share on the 6 per cent cumulative convertible prior preference stock, Series A, payable April 1, 1938, to stockholders of record March 14, 1938. No action was taken in respect of dividend on the 6 per cent cumulative convertible preferred stock.

Jones & Laughlin Steel Corp. and subsidiaries report for year ended Dec. 31, 1937, net profit of $4,788,799 after surtax of $10,000, equal to $8.15 per share on the preferred stock on which there were accumulated dividends of $28 per share at the close of 1937. Allowing for a full year's dividend requirements on the preferred stock, the net is equal to $1.19 per share of common stock. This compares with net profit of $4,129,600, or $7.03 a preferred share and 5c. a common share after preferred dividend requirements in 1936. For the quarter ended Dec. 31, 1937, the company reports a net loss after all charges of $1,773,591.

Sharon Steel Corp., Sharon, Pa., reports for 1937 net profit of $1,345,801, equal after $5 preferred dividends paid to $2.83 a share on common. This compares with net profit reported for 1936 of $1,305,852, or $3.04 a share on common, after preferred dividends paid in that year.

General Fireproofing Co., Youngstown, reports net profit for 1937 of $1,147,558 after the deduction of all charges, including estimated $353,014.81 in Federal income excess and undistributed profits taxes. Net profit for 1936 was $564,621.

Murray Ohio Mfg. Co., Cleveland, reports net profit for 1937 of $228,264 after allowing $56,214 for taxes. Net profit in 1936 was $302,254.

Electric Controller & Mfg. Co., Cleveland, reports net profit for the year ending Dec. 31, 1937, of $812,918. Net profit in 1936 was $588,697. Federal, state and municipal taxes approximating $213,000 were paid or provided for last year, President F. R. Fishback states.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., reports net income in 1937, after provision for Federal income, normal and excess profits taxes and surtax on undistributed profits, of $20,126,408, compared with $15,099,291 in 1936, an increase of 33 per cent. Orders booked for 1937 were $229,540,061 or 25 per cent above 1936 bookings of $182,521,304. Sales billed in 1937 amounted to $206,348,307, compared with $154,469,031 for 1936, an increase of 33 per cent. Unfilled orders as of Dec. 31, 1937, amounted to $60,298,087, an increase of 24 per cent over Dec. 31, 1936.

American Steel Foundries earned net profit of $3,617,761.77 in 1937 compared with $2,953,426.35 for the previous year. Taxes paid during the year were equal to $1.57 per share of common stock outstanding.

Superior Steel Co. stockholders will be asked at their meeting March 21 to approve an increase in authorized capital stock from 115,000 to 200,000 shares. There are no immediate plans for sale of the additional stock, according to Frank R. Frost, president. Superior Steel's current assets on Dec. 31, 1937, totaled $1,359,881, including $197,572 cash, and current liabilities were $1,181,811, including $962,000 funded debt due in 1938.

Westinghouse Commemoration

ADDRESSES on the career and achievements of George Westinghouse presented at sessions of the 1936 annual meeting of the American Society of Mechanical Engineers, celebrating the 90th anniversary of his birth, are contained in a booklet being distributed by the Westinghouse Electric & Mfg. Co., East Pittsburgh. Separate sections deal with the air brake, alternating current, the steam turbine, railway electrification, and industrial relations. The addresses by Paul D. Cravath, New York, on "George Westinghouse, the Man," and by James Rowland Angell, president, Yale University, on "Achievements of Westinghouse as Factors in Our Modern Life," are included.

. . . NEWS OF THE WEEK . . .

Don't Reduce Wages, Prices, Roemer Tells Business Men

HENRY A. ROEMER, president of Sharon Steel Corp. and Pittsburgh Steel Co., this past week joined steel executives who recently have been appealing for stabilization of wages and prices in steel and other industries.

"America never buys on a receding market," Mr. Roemer told the Association of Chamber of Commerce Secretaries of Ohio at Columbus, Ohio. "I do not agree with those who have been doing so much talking recently about reduced prices and reduced wages. In order to have stability of wages and the purchasing power represented by these wages, we must have stability of prices.

"When wages and prices are cut, the element of fear enters the worker's mind and his purchasing is restricted way beyond the actual percentage of the reduction in pay, and when prices are reduced, the purchaser buys only for his immediate hand-to-mouth requirements."

The Pittsburgh-Sharon executive said he is not an advocate of low wages, and that low wages are not always the answer to low costs. "More often," he said, "the more highly paid and satisfied workmen will do a larger and in the end a cheaper job. A friendly human relationship and appreciative understanding between men and management, where people are really teaming together in an honest desire to produce a better product at lower costs more frequently brings the answer.

H. A. ROEMER

"There should be no place for the price cutter and the chiseler who lowers his wages or cuts his prices in order to gain some temporary advantage within his own industry. He is a menace to society and an obstacle in the path of recovery."

Discussing the effect of wage-price reductions on smaller industrial concerns, Mr. Roemer said:

"The situation today is so highly sensitized that the slightest pressure at one point causes serious vibration throughout the entire structure, and there are those who are willing, apparently, as indicated by their actions, to topple down the house around our ears. In this fact lies a most serious threat to the corporate existence of many small concerns.

Some "Go It Alone"

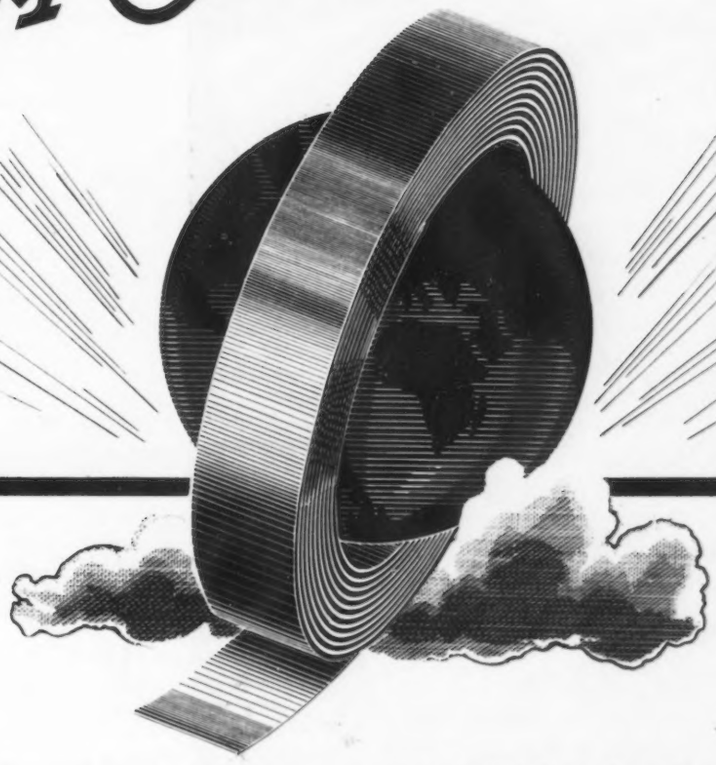
Some outfits have in the past practised the individual company policy of low prices, higher sales, higher volume of sales meaning higher production, higher production—lower costs; lower costs—greater competitive abil-

NEWS AND MARKET INDEX

Thomas Strip
COLD ROLLED STRIP STEEL

ELECTRO ZINC COATED
ELECTRO COPPER COATED
ELECTRO NICKEL COATED
ELECTRO BRASS COATED
BRIGHT FINISH UNCOATED

THE WORLD *Is Our Showroom*



You will find exhibited in every world market products made of Thomas Cold Rolled Strip. And, by these products The Thomas Steel Company enjoys an enviable reputation for unusual ability to match cold strip with the product and fabricating problems. Fewer operations, better products, faster production, and less waste are important advantages gained with specialized Thomas Cold Rolled Strip. In coils or cut lengths, it is precision-made to temper, gauge, width, in plain bright and special coated finishes as desired. An unusual service advantage is that executive, general sales, production, and engineering departments are ALL located at the mill in addition to district offices located in the principal markets. With these merits, it will pay you to check the application of Thomastrip to your particular product.

THE THOMAS STEEL COMPANY • Warren, Ohio

SPECIALIZED PRODUCERS OF COLD ROLLED STRIP STEEL

ity. With this greater selling ability again comes higher volume of sales. Some companies have operated in that squirrel-cage cycle for many years, but now we find that the larger companies are prepared and willing to play at that same game.

"The insistence of political leaders that we must have free, unrestrained and unrestricted competition is going to be awfully tough on the little fellow, and if cut-throat competitive practice is permitted to continue without regulation or control, there is only one end to that road—it means the survival of those who have the greatest financial reserves or the fattest pocketbook.

"We must think in the terms of the national welfare and the prosperity of an industry rather than the success of an individual company or the selfish desire of some individual leader.

"There is a crying need for real leadership today, and if business does not regulate itself within due and proper bounds, and does not practise decent and fair trade principles in the whole competitive situation, the results are going to be most unsatisfactory. If ever there was a time in the history of this country when the principle of balance and the philosophy of horse sense should be applied, it is now.

"Certainly this is no time for business executives to be clanking their spurs, rattling their sabres, or polishing up their badges, and likewise it is no time for political leaders to be making promises which in the end they cannot keep." Regarding the near outlook for business Mr. Roemer said:

Factors For Recovery

"We are told that in all probability the railroads will be permitted to make advances in freight rates. It seems apparent that there is a great national interest in the subject of building, particularly the building of private homes. The purchasing power of the farmer is at a reasonably high level. The need for improvement and replacement in most manufacturing industries is urgent. The automobile industry is sure to see some improvement in production during the coming months. I am told that the steel industry plans the expenditure of approximately $175,000,000 for the purchase and installation of new equipment in 1938. In regard to world affairs Mr. Roemer said:

"Those who ignore the threat of war are simply burying their heads in the sand. What effect this development may have on business I leave to your imagination."

Hot Dip Galvanizers Reelect Officers

PRESENT officers and directors of the American Hot Dip Galvanizers Association, Inc., were reelected at the annual meeting held at Pittsburgh last week. Stuart J. Swensson, American Bank Building, Pittsburgh, is secretary of the association which will continue its active program on technical research during the coming year. Wallace G. Imhoff has been reappointed technical director of research. No change in advertising plans is indicated except that emphasis will be placed on specific industries.

The officers and directors authorized the reprinting of the association's specifications folder which will be more widely distributed during the coming year. Monthly bulletins are to be continued.

1200 Told Solutions For Labor Problems At Chicago Gathering

CHICAGO.—Twelve hundred industrial relations directors and supervisors recently heard numerous speakers offer remedies for labor difficulties at the three-day conference of the American Management Association at the Palmer House.

The program included a defense of the National Labor Relations Board by Charles Fahy, its chief counsel, who declared that because of the NLRB "freedom is greater in America than ever before. The law is a very simple one to comply with," said Mr. Fahy. "Executives and directors of personnel will more and more make it a matter of pride to conform in letter and spirit with a law that does no more than to protect the fundamental and essential liberties of men and women who work for them."

Policy One of Compulsion

However, Russell L. Greenman, assistant manager, department of manufacture, United States Chamber of Commerce, charged that the policy of the Labor Board "is that of compulsion and punishment." Even though the board was given a mandate by Congress to promote collective bargaining it does not necessarily follow that "the (Wagner) act itself is wisely conceived, that all of the board's decisions have been beyond reproach, that its agents have always acted without bias, or that its orders in every instance have facilitated the process of genuine collective bargaining," he said.

Here is what other Management Association speakers said, in brief:

THOMAS G. SPATES, director of industrial relations, General Foods Corp.—"The universal objective of employee-employer relationship is social justice, or industrial peace, and the most important policies and practices that have this objective as their goal are legislation, traditional trade unionism and the technique of personnel administration."

T. G. GRAHAM, vice-president, B. F. Goodrich Co.—"Management must assume the responsibility for any friction that may develop between foreman and worker so long as it selects both men, and should recognize the human factors in industry and adapt its organization and policies to fast moving social trends."

H. L. NUNN, president, Nunn-Bush Shoe Co.—"Instead of paternalism, workmen desire the opportunity to express themselves and vote on working conditions, the chance to negotiate terms of employment, the right to state the wages for which they will work, and a voice and vote on whether fellow employees should be discharged."

RALPH A. LIND, labor relations counsel, Stevenson, Jordan & Harrison—"An agreement, it is true, is not normally held to be legally binding upon any labor organization. An agreement, frankly, is but a gesture on the part of management to maintain peaceful and harmonious relations in your plant. If you intend to live up to your oral agreement and you hope and want the organization

to live up to it, then by all means sign it."

JOHN H. GOSS, vice-president, Scovill Mfg. Co., Waterbury, Conn.—"The natural way to meet a militant challenge is with a militant defense. Collective bargaining will not succeed until the atmosphere of approach and reception is more favorable. Don't lose your sense of humor, and if you haven't one, get some one who has to deal with your men. Do not lose your temper. Do not say no until a discussion has been held. There must be no stalling. Meet groups and not individuals."

F. J. DICKSON, chief of employees relations research department, Western Electric Co.—"Employee misinformation is largely due to deficiencies in the system of communication between employee and supervisor and between the various supervisory levels within the organization. Management should know as much about the employees' thoughts as they know about what the management is thinking."

Other speakers on the program included A. B. Gates, director of training, Eastman Kodak Co.; L. A. Appley, supervisor of training and education, Socony-Vacuum Oil Co.; Albert S. Regula, Industrial Relations Counselors, Inc.; Dr. Morris S. Viteles, director of personnel research and training, Philadelphia Electric Co., and A. L. Kress, industrial relations department, National Electrical Manufacturers' Association.

Japanese Company to Expand Alloy Output

TOKYO (*By Mail*).—In view of the increasing demand for special steel materials under the influence of the wartime economic system, the Japan Iron Sand Industrial Co. has drafted a large-scale production increase plan.

The plan involving some 6,000,000 yen provides for erection of a special steel mill with an annual production capacity of 90,000 metric tons of special steel and high-grade carbon steel, 60 metric tons of ferrovanadium and 840 metric tons of oxidized titanium, at Kazama, Hyogo Prefecture. The proposed mill is to be equipped with 10 sets of 10-ton electric furnaces and accessories.

The work on the erection of the mill will be divided into three stages, the first-stage work scheduled to be completed by March, 1939, involving an annual production of 35,000 metric tons.

Sharon, Pittsburgh Steel Sign "Escape Clause" SWOC Pacts

SHARON STEEL CORP., Pittsburgh Steel Co. and National Supply Co. have signed contracts with the Steel Workers Organizing Committee giving these companies or the union the right to terminate their agreements within 20 days provided no settlement of differences which may come up in the future is made within that period.

Contract negotiations between Wheeling Steel Corp. and the SWOC were expected to be concluded this week while SWOC conferences with Crucible Steel Co. of America are scheduled for March 7. An Allegheny Steel Co. union conference was scheduled for March 2.

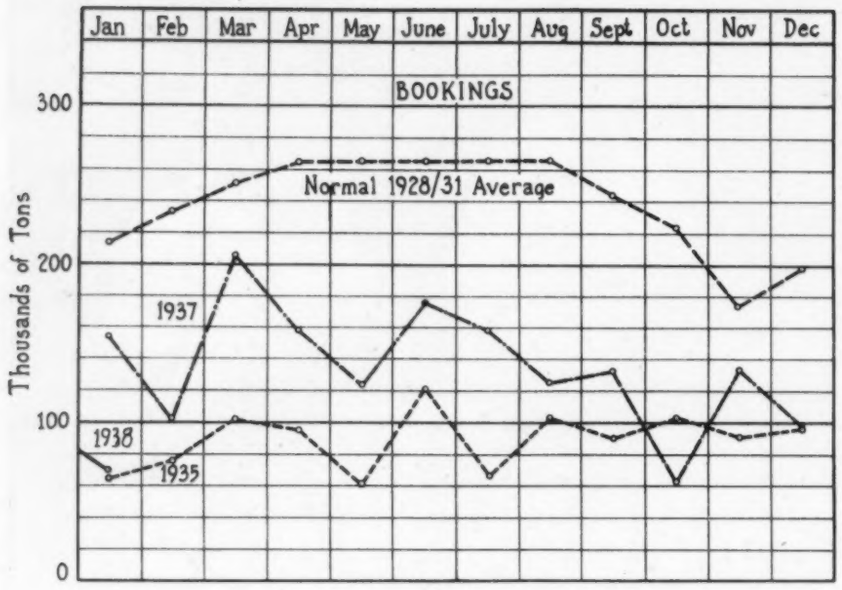
The SWOC reports that A. M. Byers Co. has extended its present union contract 90 days and that contracts including the 20-day escape clause appearing in the agreements signed recently with United States Steel Corp. subsidiaries have been made with Mackintosh-Hemphill Co., Pittsburgh; Page Steel & Wire Co., Monessen, Pa.; Robertshaw Thermostat Co., Youngwood, Pa.; Connellsville Mfg. & Mine Co., Connellsville, Pa.; and Washington Tin Plate Co., Washington, Pa.

Jones & Laughlin Steel Corp. has likewise signed an agreement which gives the SWOC exclusive bargaining rights for its employees. However, another J & L employees' organization, the Independent Iron and Steel Workers of Aliquippa, is pushing a membership drive, apparently to seek collective bargaining privileges when the SWOC contract expires.

Du Pont Establishes New Electroplating Division

FORMATION of an Electroplating Division is announced by E. I. du Pont de Nemours & Co., Wilmington, Del., to correlate various manufacturing departments of the company contributing to the plating industry.

J. C. Pickard, until recently West Coast manager of the R. & H. Chemicals Department Pacific division, will manage the new department which will handle all du Pont products in the electroplating field. Assisting him as assistant manager will be C. M. Hoff, formerly of the Grasselli Chemicals Department plating division.



Structural Steel Work 30.6% of Normal

JANUARY was the first month in which the full force of the business recession made itself felt in lettings of structural steel contracts, according to the monthly report of the American Institute of Steel Construction, 200 Madison Avenue, New York. During January orders were 30.6 per cent of normal (normal being the average annual business during the four years 1928 to 1931, inclusive).

Total estimated bookings of the industry in January were 71,619 tons compared with 153,806 tons in January, 1937. The January total was below that of any month last year except October, which had 62,267 tons.

Shipments of fabricated structural steel in January were 86,421 tons compared with 99,934 tons in January, 1937.

The monthly average of structural steel bookings last year was 135,720 tons.

Labor Board Hearings Switched to Pittsburgh

PITTSBURGH.—Two long drawn-out National Labor Relations Board hearings on unfair labor practice charges against Weirton Steel Co., Weirton, W. Va., and the Moltrup Steel Products Co., Beaver Falls, Pa., will be continued at Pittsburgh this week. The Weirton hearing has been shifted from Steubenville, Ohio, while the Moltrup hearing, despite objections of the company counsel, have been moved from Beaver, Pa.

The Weirton hearing, enlivened somewhat by bitter clashes between NLRB and company counsel, has been in progress since August, 1937, and gives promise of extending several months longer. The NLRB examiner has under advisement a request by Weirton counsel for a three-week recess before the presentation of the company's defense against the charges is started. The shift in location of Weirton hearings will necessitate bringing a host of witnesses from Weirton, W. Va., and Steubenville to Pittsburgh for testimony.

The Moltrup hearing began three weeks ago and may take another six months.

New Factory Has Steel Lockers for Every Worker

CHICAGO.—Fully supplied with all-steel lockers for the convenience of employees is the new three-quarter million dollar plant of the Campana Sales Co., Batavia, Ill., maker of Italian Balm hand lotion. Made by All-Steel Equip Co., Aurora, Ill., these lockers are furnished with private combination locks and are finished to harmonize with the floor and walls.

. . PERSONALS . .

JAMES CAVEN FOSTER has been elected president of the Northwestern Barb Wire Co., Sterling, Ill. He resigned as general manager of sales of the Jones & Laughlin Steel Corp., Pittsburgh, to accept the new post. PAUL W. DILLON, who has been chairman of the board and president of the Northwestern Co., which manufactures a complete line of wire products, will continue as chairman. Mr. Foster began his career in the steel business with Jones & Laughlin in 1913 in the order department. Two years later he went to the sales department, where the major part of his experience covered the sale of wire and wire products. Before being appointed general manager of sales in 1935 he had been manager of wire sales. His 25 years of service with Jones & Laughlin was unbroken except for the time spent with the American Expeditionary Forces in the World War.

J. C. FOSTER

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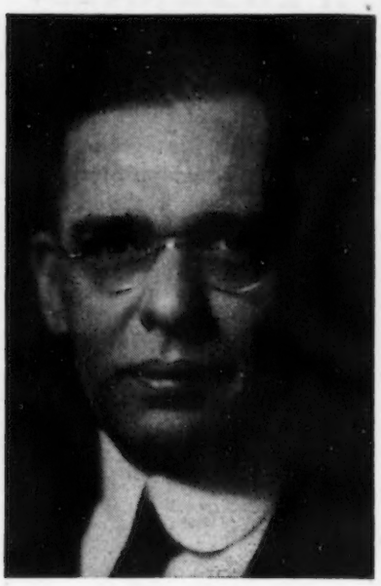
GEORGE H. BUCHER, executive vice-president of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been elected president of the company succeeding FRANK A. MERRICK, who has been elected vice-chairman. PAUL J. MYLER, president of the Canadian Westinghouse Co., has been made a director of the parent company.

Mr. Bucher joined the Westing-



G. H. BUCHER

house company in 1909, as a member of the graduate students' training course after his graduation from Pratt Institute. He worked successively as a coil winder, as a worker in the transformer assembly and as a motor generator tester. Two years later he was transferred to the export department of the company. Interested in the problems of electrification in Japan, he pushed the work there with the result that the company had a major part in modernizing that country. In 1920 he was appointed assistant to the general manager of the Westinghouse Electric International Co., and a year later, 1921, assistant general manager. This position he held until 1932, when he was elected vice-president and general manager. In 1934 he was elected president and general manager of the International company and the following year vice-president of the parent company. In 1937 he was named executive vice-president of the parent company.

Mr. Merrick became identified with the Westinghouse company in 1902. When the Canadian Westinghouse Co., Ltd., was formed the following year, he had charge of construction of its plant at Hamilton, Ont., where he remained as superintendent and later became successively manager, vice-president, general manager and director. For two years after the War, Mr. Merrick was located in London as special representative of the company. In 1925 he became vice-president and general manager of the Westinghouse Electric & Mfg. Co.,

F. A. MERRICK

and four years later was elected president.

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MARSHALL POST, vice-president, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., has been nominated president of the American Foundrymen's Association for 1938-1939. H. S. WASHBURN, president of the Plainville Casting Co., Plainville, Conn., has been nominated vice-president. Directors to serve for three years include: HYMAN BORNSTEIN, director of research, Deere & Co., Moline, Ill.; F. A. LORENZ, JR., vice-president, American Steel Foundries, Chicago; D. O. THOMAS, general manager, Saginaw Malleable Iron division, General Motors Corp., Saginaw, Mich.; G. A. SEYLER, works manager, Lunkenheimer Co., Cincinnati, and H. S. HERSEY, vice-president, C. O. Bartlett & Snow Co., Cleveland.

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G. W. PRESSELL, executive vice-president of E. F. Houghton & Co., Philadelphia, has also assumed the position of general sales manager. C. G. SCHULTZE, former sales manager of the Central division, has been named assistant general sales manager. The Central division has been divided into three sections: Pittsburgh, of which D. J. RICHARDS is sales division head; Detroit, with H. E. MARTIN; and Chicago, with E. C. BARLOW at the head. H. E. SANSON is Eastern district sales manager; W. H. BRINKLEY, is Southern

division head, and A. A. MILLER, Western district sales manager. Departmental heads in the main office in Philadelphia are set up under a newly-created position of research sales manager, filled by L. D. HOLLAND.

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WILLIAM C. COWLING has been elected vice-president of Willys-Overland, Inc. Mr. Cowling was associated with the Ford Motor Co. for 23 years and for the past six and one-half years was general sales manager of Ford, directing both domestic and foreign sales. Previous to his heading the Ford sales force, he served for

W. C. COWLING

J. A. COMSTOCK

many years as the executive in charge of traffic.

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J. A. COMSTOCK recently joined the Surface Combustion Corp., Toledo, as consulting metallurgist in the investigation and development of metallurgical processes utilizing furnace atmospheres. A graduate of the University of Illinois, Mr. Comstock during the last four and one-half years has served as metallurgist with the Illinois Tool Works, Chicago. For nine years previous to that he was engaged in research for the People's Gas, Light & Coke Co., Chicago. For seven years he served as secretary and treasurer

S. R. THOMAS

C. W. ZINK

of the Chicago chapter of the American Society for Metals.

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S. R. THOMAS has been appointed chief engineer of Bantam Bearings Corp., South Bend, Ind. For the past year and a half Mr. Thomas has been manager of the automotive bearing division going to Bantam after an association of four years with the Cord interests, where he was chief engineer of Auburn, Cord and Duesenberg. He has had 24 years' experience in a wide variety of engineering projects. He will continue in charge of the automotive work.

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CHARLES W. ZINK was recently appointed superintendent of the sheet metal department of the Highland Park plant, Chrysler Corp. He succeeded the late F. L. ALLDIS for whom he had been assistant superintendent during the last 15 years. Mr. Zink was born in Detroit and served an apprenticeship in tool and die making in 1897 with the Diamond Stamped Ware Co., where his wages were $4 a week, often including Sundays. He was the first diemaker employed by the Cadillac Motor Car Co. and also was the first diemaker for Dodge Brothers. In 1901 he started to work as a diemaker for the Briscoe Mfg. Co., which was later controlled by the U. S. Motor Co. and still later by the Maxwell Motor Car Co. As a Maxwell employee he was promoted from diemaker to foreman of the die department, then to assistant superintendent before Maxwell became part of the Chrysler Corp.

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HENRY BUTLER ALLEN, for many years chief metallurgist for Henry Disston & Sons, Inc., Philadelphia, has been awarded the honorary degree of Doctor of Science by Temple University, Philadelphia, "in recognition of his outstanding work as secretary and director of the Franklin Institute, Philadelphia."

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J. K. FITZGERALD, who has been associated with the Niagara Machine & Tool Works, Buffalo, for many years, has been made district sales manager in the newly-opened Cleveland office of the company in the Leader Building.

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B. F. DEVINE, of the Chain Belt Co., Milwaukee, has been reelected chairman of the Mixer Manufacturers Bureau, affiliated with the Associated General Contractors of America, Inc.

DR. ROBERT E. DOHERTY, president, Carnegie Institute of Technology, Pittsburgh, has been awarded the 1937 Lamme Medal by the American Institute of Electrical Engineers "for his extension of the theory of alternating current machinery, his skill in introducing that theory into practice, and his encouragement of young men to aspire to excellence in this field."

H. B. ALLEN

J. F. PRINCE has been placed in charge of the newly-opened branch office in Atlanta, Ga., of the Flexrock Co., Philadelphia. He will have the title of Southern sales manager.

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ALFRED J. DIEFENDERFER has been appointed superintendent of the new slabbing mill at Carnegie-Illinois Steel Corp.'s Edgar Thomson works, Braddock, Pa. MARLIN C. SCHWAB has been appointed assistant rolling superintendent at the company's Farrell, Pa., works succeeding Mr. Diefenderfer. Mr. Diefenderfer has been in the employ of the company since 1912 at the Farrel and Sharon plants and has been assistant rolling superintendent at Farrell since 1929. Mr. Schwab has been at the Farrell works since 1927 and since 1930 has been assistant metallurgist.

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W. WARD POWELL, general sales manager, Mesta Machine Co., Pittsburgh, recently sailed for Japan.

JOSEPH A. MOSKOWITZ, of Samuel Sons Iron & Steel Co., Inc., Brooklyn, N. Y., has been appointed chairman of the industrial relations committee of the Institute of Scrap Iron and Steel. The committee is one of the standing committees of the institute. The industrial relations committee will consist of the following: Vice-chairman: MAURICE SCHLAFER, of Schlafer Iron & Metal Co., Detroit; EDWARD SUISMAN, of Suisman & Blumenthal, Inc., Hartford, Conn.; S. H. ROBINSON, of S. H. Robinson & Co., Inc., Knoxville, Tenn.; DAVID H. COHEN, of D. H. Cohen & Co., St. Louis; HARRY N. COHN, of Butler Iron & Steel Co., Butler, Pa.; HARRY KIRCHMAN, of Allegheny Iron & Metal Co., Philadelphia; FRANK CONTEY, of Frank Contey, Inc., Jersey City, N. J.; LOUIS PULASKI, of Pulaski Iron & Metal Co., Houston, Tex.; MAX FRIEDMAN, of Max Friedman Co., Cleveland; WILLIAM J. WOLF, of Wolf & Co., Hamilton, Ohio; A. J. CLONICK, of Clonick Steel Co., Chicago; LOUIS CONTEY, of Trojan Scrap Iron Corp., Troy, N. Y.; JAY J. RISMAN, of Morrison & Risman Co., Inc., Buffalo, and SAMUEL H. BASSOW, of Bassow Brothers, New York.

J. K. FITZGERALD

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LOUIS J. BORINSTEIN, identified with the firm of A. Borinstein, Indianapolis, has been appointed chairman of the legislative committee of the Institute of Scrap Iron and Steel. The committee will consist of the following: Vice-chairman, JOSEPH A. SCHIAVONE, of Michael Schiavone & Sons, Inc., New Haven, Conn.; M. L. KIMERLING, of M. Kimerling & Son Co., Inc., Birmingham; LEWIS RAPHAELSON, Wilmington; NATHAN LOMM, of Commercial Iron & Metal Co., Inc., New Orleans, and MAURICE D. FRIEDMAN, of the company of the same name, Ashland, Ky.; BARNEY SIMON, of Briggs & Turivas, Blue Island, Ill.; HENRY BRADFORD, of American Iron & Metal Co., Troy, N. Y.; SAUL S. FRANKEL, of Rochester Iron & Metal Co., Rochester, N. Y.; ROBERT COHEN, of General Scrap Iron Co., Fall River, Mass.; WESLEY E. CEELEY, of Simon Iron & Steel Corp., Lansing, Mich., and H. N. TRIMBLE, of H. N. Trimble Co., Pittsburgh.

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D. M. CURRY, field research representative of the International Nickel Co., New York, will give an illustrated talk on non-ferrous castings before the Seattle chapter of the American Foundrymen's Association on March 9 at the Roosevelt Hotel in Seattle.

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BENJAMIN F. FAIRLESS, president of the United States Steel Corp., is to be the principal speaker at the annual meeting of the Texas Wholesale Hardware Association on June 17 at the Buccaneer Hotel, Galveston, Tex.

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HARRY TERRY, who resigned as vice-president of the Cramer-Krasselt Co., Chicago, on Jan. 1, 1937, to open his own offices as advertising and sales economist, has moved to 8 South Michigan Avenue, Chicago.

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E. ETZEL, former purchasing agent at Toledo Steel Products Co., Toledo, has been transferred to the main plant of Thompson Products Co., Inc., Cleveland, as buyer.

PAUL H. HAKE has been named superintendent of blooming and rolling mills at the Brier Hill plant of Youngstown Sheet & Tube Co. Mr. Hake goes to Youngstown from the Gary works of Carnegie-Illinois Steel Corp., where he had been turn foreman in the billet mill since 1924. He entered the steel industry at the Brier Hill Steel Co. in Youngstown where he remained until 1922, when he became associated with Inland Steel Co. at Indiana Harbor, Ind.

DONALD BLASIER has been named assistant superintendent of blooming

(CONTINUED ON PAGE 103)

Scrap Becomes Our Most Important Iron and Steel Export Item

THE United States is by far the largest supplier of iron and steel scrap to other countries. Its export trade in scrap began in 1896, when $11,389 worth went to Canada, Italy, the United Kingdom and China, and there has been a steady growth up to the 4,000,000 tons exported in 1937.

Our export trade in scrap is interestingly analyzed in a special report of the Metals and Minerals Division of the Bureau of Foreign and Domestic Commerce. The report was prepared by Benjamin W. Ashmead, and is published in the department's journal, *The Iron and Steel Fortnightly* of Feb. 25.

The role that American scrap has played in supplying other steel producing countries with sufficient raw material is commented on as follows:

"All countries do not possess adequate amounts of the materials necessary for the economic operation of a large iron and steel industry as does the United States. Some lack sufficient iron ore supplies, others are deficient in fuel, and still others (even though possessing these materials in substantial quantities) are faced with another difficult problem—the economic transportation of these materials to the producing centers or the finished product to the market. Then again there are times when unusual conditions cause an excessive rise in iron and steel consumption (notably in 1937) and it would be uneconomic for affected countries to expand their blast furnace facilities to a point where sufficient quantities of pig iron could be produced to make all of the steel ingots needed.

"Japan is a notable example of a country possessing an important iron and steel industry without adequate domestic resources to support it. The Union of South Africa has been producing steel since 1911, but it was not until June, 1926, that blast furnaces at Newcastle began to produce pig iron from native iron ore. Prior to that date, scrap was the only raw material used, and today it remains an important factor in the operation of this industry.

United Kingdom Demonstrates Scrap Importance

"The experience of the United Kingdom in 1937 forcibly demonstrates the importance of scrap in the economy of the iron and steel industry. Prior to the World War, steel plants in that country used about 30 per cent scrap and 70 per cent pig iron to produce one ton of steel ingots. At the close of 1937, the ratio for scrap had risen to about 60 per cent. Some 6,225,000 tons of steel scrap and approximately 626,000 tons of cast iron scrap were used in the United Kingdom in producing about 11,500,000 tons of steel ingots in 1936. In 1937 the steel ingot output was in the neighborhood of 12,500,000 tons, and it is estimated that 7,500,000 tons of scrap went into that production.

"Very serious difficulties had to be overcome in that year in order to obtain the necessary scrap supplies. Other European countries were also keenly interested in supplementing their pig iron output with scrap in order to meet their enlarged domestic needs for steel products. Hence, a sharp increase in world quotations for scrap iron and steel resulted. To stabilize scrap supplies in the United Kingdom at reasonable prices, the British Iron and Steel Federation agreed to confine its purchases to the (local) National Federation of Scrap Iron and Steel Merchants which, in turn, agreed not to sell scrap for either direct or indirect export. British prices of steel works scrap are now strictly supervised, the approved agreement stipulating fixed maximum prices for the various grades of steel scrap—by quantity and quality. During the year, homes, works, collieries, etc., were called upon to release idle scrap and an important quantity was collected until at the close of 1937, the shortage of scrap in the country had been eased considerably.

European Scrap Agreement

"Another important event in the trade in scrap occurred in 1937 when various European countries effected a scrap agreement to prevent quotations from becoming uneconomic. The participants to this agreement are Austria, Czechoslovakia, Germany, the United Kingdom, Hungary, Italy, Poland, Rumania, Sweden, and Yugoslavia.

In the period 1900-1933, the United States exported approximately 4,455,000 tons of scrap, the highest annual totals being reached in the following years:

1933	773,000	1932	228,000
1929	557,000	1920	219,000
1928	516,000	1916	213,000
1930	359,000	1917	146,000
1927	239,000	1931	136,000

"Exports in 1934 exceeded one million tons for the first time when shipments amounted to 1,800,000 tons. In that year, iron and steel production in the principal foreign producing

centers was gaining momentum, and minor producers were augmenting their capacities. Likewise, countries which had previously possessed no iron and steel industry began the installation of furnaces and mills. The result was an urgent call for raw materials with which to manufacture steel products to cope with this ever-mounting consumption, and the use of scrap grew more and more important. American exports in 1935 continued to increase, the total for the year being in excess of 2,000,000 tons. It recorded a slight decline to 1,900,000 tons in the following year chiefly because the more important consumers (notably Japan) literally scoured the world to supplement scrap imported from the United States owing to its higher cost here.

New Record in 1937

"With the opening of 1937, the shortage of scrap throughout the world had become more pronounced. The result was that American exports in that year advanced to 4,000,000 tons despite the fact that the average price per ton registered a sharp increase over 1936 quotations. As stated earlier, the swollen level of consumption, and the shortage of iron ore supplies combined with inadequate pig iron production facilities obliged European and Japanese producers to import heavy quantities of scrap. The outstanding individual markets were:

	1937 Gross Tons	1936 Gross Tons
Japan	1,900,000	1,100,000
United Kingdom	850,000	360,000
Italy	380,000	280,000
Poland	270,000	30,000
Canada	190,000	65,000
The Netherlands	143,000	5,000

"An outstanding feature of the scrap export trade of the United States in the past two years has been the high level of shipments to European markets which, in 1937, approximated those to the Far East (usually by far the leader). Shipments to Japan in December, 1937, were at their lowest level in a number of years when they amounted to only 9000 tons; shipments to the United Kingdom during the same month were 126,641 tons.

"American scrap exports in the 1934-1937 period aggregated 9,800,000 tons or approximately double the amount shipped in the 1900-1933 period, and reflect clearly not only the sharp increase in scrap utilization, but also the increasing consumption of iron and steel throughout the world.

"The comparative statistics in the table below, show the principal customs districts through which scrap exports from the United States were cleared in 1937.

"From an inauspicious beginning in 1896 when American scrap exports were valued at $11,000 this trade now has a higher annual aggregate value than any other item within the entire iron and steel export grouping. In 1933, scrap exports from the United States were valued at $6,874,000, and in 1934 this value had climbed sharply to $19,188,000. A further rise to $23,000,000 resulted in 1935, and in 1936 shipments were valued at $24,500,000. However, in 1937 scrap exports reached the astonishing value

	1937 Tons	1936 Tons	1935 Tons	1934 Tons
New York	836,000	435,000	518,000	93,000
Galveston	540,000	231,000	167,000	164,000
New Orleans	277,000	125,000	98,000	109,000
Massachusetts	242,000	137,000	198,000	14,000
Florida	224,000	138,000	119,000	186,000
Virginia	221,000	83,000	101,000	81,000
Maryland	203,000	102,000	68,000	93,000
Philadelphia	193,000	60,000	143,000	149,000
Georgia	177,000	79,000	57,000	38,000
Sabine	132,000	61,000	78,000	57,000

of $80,000,000. The United States in the past five years has received from foreign scrap purchasers the sum of $153,562,000. A further insight into the importance of the scrap export trade is revealed by the sharp advance in quotations during the five years in question. Export scrap in 1933 was invoiced at an average of $8.80 per ton, and in 1934 the figure was $9.90. In 1935 it advanced to $10.90, in 1936 to $12.60, and the average export price per ton of scrap shipped during 1937 stood at $19.90."

Lower Consumption of Iron Ore Slows Plans For Lake Shipping

CLEVELAND.—Greatly reduced consumption of iron ore by blast furnaces during the last few months has slowed preparations for the opening of the forthcoming navigation season on the Great Lakes and removed the necessity for an early start on the ore movement. Contrasted with the 62,598,836 tons of ore shipped by water in 1937, only 30,000,000 to 35,000,000 tons are expected to be moved this year, mostly in the middle of the navigation season.

At furnaces and Lake Erie docks Feb. 1 ore on hand totaled 38,881,832 tons, compared with 26,747,006 tons on the same date a year ago when preparations were being made to expedite the opening of navigation through the use of icebreakers. Only 70 furnaces using Lake Superior iron ore were in blast Jan. 31, compared with 141 on the same date a year ago.

Meanwhile, final statistics on the 1937 movement, which was exceeded in only 1916 and 1929, have been completed. The latest report from the Lake Superior Iron Ore Association shows shipments from mines during 1937 as follows:

Range	To Upper Lake Ports	All Rail	Total
Mesaba	45,442,536	381,035	45,823,571
Marquette	5,602,846	144,966	5,747,812
Gogebic	5,651,878	9,392	5,661,270
Menominee ...	2,646,980	2,082	2,649,062
Vermilion	1,412,596	40,484	1,453,080
Cuyuna	1,766,123	9,322	1,775,445
Total	62,522,959	587,281*	63,110,240

*Includes 918 tons lost in transit.

Total shipments from leading mines in the Mesaba range included the following: Sellers, 6,084,400; Mahoning, 5,166,410; Hull Rust, 4,178,452; Missabe Mountain, 2,733,856; Hill Annex, 2,469,654; Morris, 2,248,830; Adams Spruce Group, 1,988,118; Minnewas, 1,975,207; Grant, 1,378,248; Morrison, 1,177,853; Fraser, 1,093,233.

In the Marquette range, Negaunee mine shipped a total of 792,506 tons; Maas, 778,757; Lloyd, 598,116, and Cliffs Shaft, 515,840 tons, among the 22 mines listed. In the Menominee range, Penn Mines shipped 310,727 tons, followed by Forbes, 289,296, and Hiawatha No. 1, 282,413.

Montreal mine led the Gogebic range with 1,174,185 tons, followed by Plymouth with 740,691, and West Davis with 669,040. In the Cuyuna range, Sagamore's 408,847 tons was followed by Mahnomen with 371,387. In the Vermilion range, Pioneer mine shipped 597,318 tons, followed by Zenith with 424,026 tons.

Total beneficiated ore from Minnesota mines was 20,242,512 tons, total for Michigan and Wisconsin, 4,717,906 tons, making a grand total of 24,960,418.

Japan to Control All Steel Supplies

TOKYO (*By Mail*).—The Iron and Steel Control Council, which will control the distribution of iron and steel so as to make abundant the supply of the metal to the munitions industry will be established in the Commerce Office. The selection of the members of the organization having been almost completed, the formal inauguration will take place soon, according to the Tokyo *Nichi Nichi*.

The control of the new council will cover not only the munitions industry, but also the peace industry. It will draw concrete plans for iron and steel distribution on the basis of supply and demand estimate during a certain period.

The council will order an iron and steel cooperative sales organ to put the plan into practice. It will also request the leading iron and steel consumers to organize an association so that the distribution control may be effected smoothly.

British May Restore Duty on Pig Iron

LONDON (*By Mail*).—An application is understood to have been submitted to the British Import Duties Advisory Committee for the reimposition of the duty on pig iron in the near future. More adequate supplies are now available for British manufacturers and the domestic producers believe that the duty should be reimposed without delay. The Committee's decision on the matter is expected very shortly.

The import duty on pig iron of 33 1/3 per cent was dropped as from March 3, 1937.

Britain Takes More Steel From U. S.; Its Own Production At High Mark

LONDON (*By Mail*).—British steel production in January was the highest for that month ever recorded. At 1,081,400 tons, it compares with 1,103,800 tons in December and with 998,900 tons in January, 1937.

Pig iron production figures showed a similar improvement. Output in January amounted to 761,100 tons, compared with 650,700 tons in January, 1937, and 783,800 tons in December.

The increase of 20,000 tons in the imports of iron and steel into Britain during the month (308,735 tons against 288,343 tons in December) scarcely indicates the change which has occurred in the market for foreign steel. With the exception of one month, the tonnage has increased steadily from 198,100 tons last May to 308,735 tons in January. One of the most notable increases is the jump in the imports of semi-finished steel from 75,598 tons in December to 94,800 tons in January.

A significant feature of the statistics is that in January the United States took place over France as Britain's principal supplier, imports from the United States totaling 81,159 tons against 59,067 tons from France. This is a very substantial rise over the total of 54,211 tons imported from America in December, in which month 56,568 tons was also imported from France.

An interesting development in the European steel market is the attempt to reach an international agreement with regard to quotations for fabricated steel structures in the export markets. Meetings have recently taken place between British and German interests and it is hoped to arrive at an agreement, which will also embrace the French and Belgian structural steelmakers, for coordinating prices and conditions when tendering for overseas orders.

CIO Union Wins In Harvester Election

CHICAGO.—The Farm Equipment Workers' Association, a division of the CIO, last week was chosen the collective bargaining unit at the tractor works of International Harvester Co. in Chicago, at a NLRB-sponsored election.

Of a total 5496 ballots cast, 3255 favored the CIO organization, 1821 endorsed the plant's independent union, and 349 votes were cast for no representation. A division of the AFL was chosen as the bargaining unit for the die-sinkers, the vote being 34 in favor versus 18 for the CIO unit.

In previous Harvester elections, the CIO won at the Minnesota ore mines, and lost at the coal mines in Kentucky and at the Springfield, Ohio, motor truck plant. Company officials said that in 15 other plants union majorities are insufficient to warrant election requests.

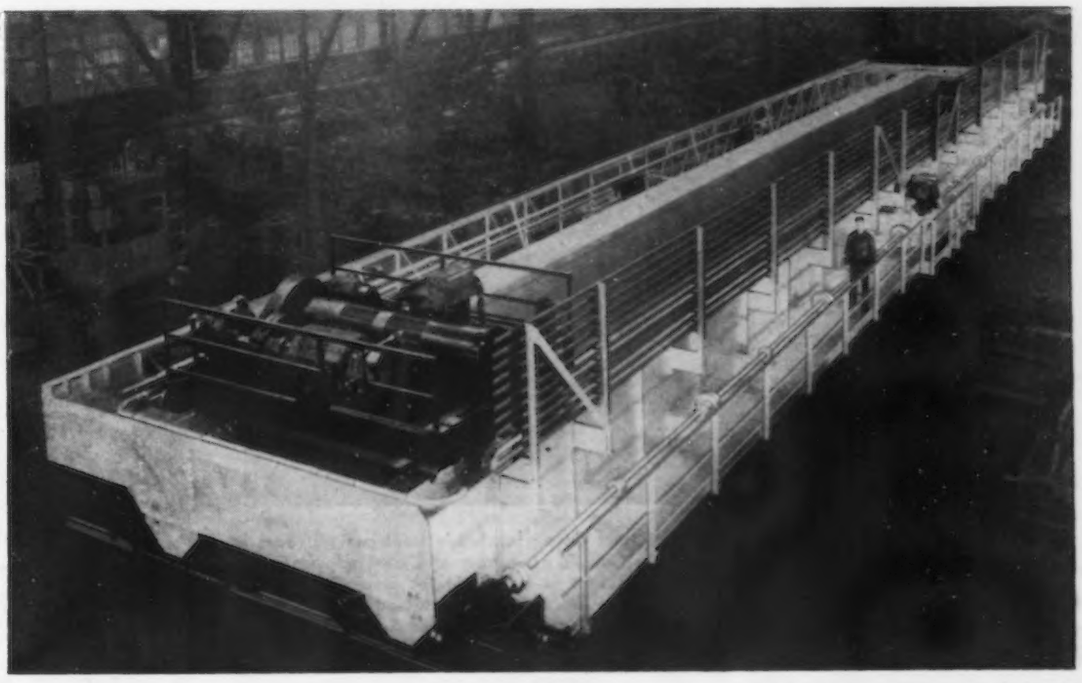
A new SWOC contract was signed last week by the Gary Screw & Bolt Co., Gary, in which the union lost its plea for exclusive bargaining rights, but obtained from the company an agreement not to contest a petition for a Labor Board election.

Purnell Chairman Of NAM Labor Committee

FRANK PURNELL, president of Youngstown Sheet & Tube Co., has been appointed chairman of a committee created by the National Association of Manufacturers to improve working conditions in American industries.

One objective of the new committee, according to Charles R. Hook, the association's president, will be to make available to small and medium-sized manufacturers the experience and study of others in plant medical services, sanitation, lighting, heating, ventilation and safety.

H. C. Beaver, president, Worthing-



THE Cleveland Crane & Engineering Co., Wickliffe, Ohio, has built what it says is the largest all-welded mill type crane ever constructed. The crane is one of 15 that are being built of the same span and design. It is 120-ft. span and weighs 137½ tons. Every major section, such as the two girders, the four end trucks, trolley, cage, etc., are fabricated into rigid one-piece units by welding. No rivets were used. Bolts were employed to tie the major sections together because of shipping and erection limitations.

ton Pump & Machinery Co., Harrison, N. J., is committee vice chairman and Dr. Victor G. Heiser (author of "An American Doctor's Odessey") is committee consultant. Chairman of an advisory committee is Dr. W. Irving Clark, personnel director of Norton Co., Worcester, Mass.

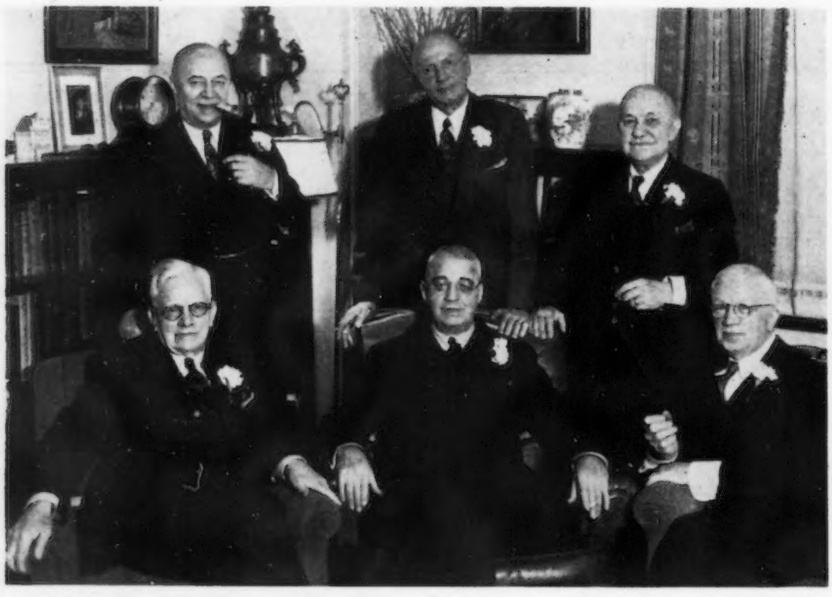
John Hulst Gives a Birthday Party

JOHN HULST, vice-president of the United States Steel Corp., celebrated his 66th birthday Feb. 20 in the Hotel Pennsylvania, where he has made his home since the hotel was opened in 1919. With Mr. Hulst as his guests were some of his oldest friends; men who have known him all their lives and whose careers have marched with his over the past 40 years. Among these were Col. A. H. Swartz, who has known Mr. Hulst all his life and who was formerly associated with him in the steel business; C. F. W. Rys, chief metallurgist of the Carnegie-Illinois Steel Corp.; John Sias, assistant vice-president of the U. S. Steel Corp.; H. J. Davis, retired but formerly general superintendent of the Blairton Steel and Coke Works, and Walter Rachals, assistant to the vice-president of the U. S. Steel Corp. Part of the entertainment provided by Mr. Hulst's steel associates was the showing of a motion picture of the launching of the *John Hulst*, an ore boat more than 600 ft. long.

Iowa Engineers To Discuss Management

THE Iowa Manufacturers Association, University of Iowa college of engineering and Tri-Cities section of the American Society of Mechanical Engineers will hold a management conference April 8 at Iowa City, Ia.

Ralph H. Landes, industrial engineer, Western Electric Co., Chicago, will discuss the "Evaluation of Occupations and the Factors Involved in Setting Base Rates" and W. A. Reinhard, engineering department director, American Institute of laundering, Joliet, Ill., will talk on "The Application of Motion and Time Principles in the Laundry Industry." L. P. Persing, wage rate supervisor, Ft. Wayne, Ind., works of General Electric Co., is scheduled to speak on "A Training Program in Principles of Motion Economy," and Ralph M. Barnes, professor of industrial engineering University of Iowa, will describe "Some Practical Applications of Motion Study Research."



JOHN HULST, vice-president of United States Steel Corp., (seated in front center) recently celebrated his 66th birthday. With him were Col. A. H. Swartz of Cleveland (front row at left) and Walter Rachals, assistant to vice-president of United States Steel Corp. (front row at right); standing at rear (left to right) are C. F. W. Rys, chief metallurgist of Carnegie-Illinois Steel Corp., Pittsburgh; John Sias, assistant vice-president of United States Steel Corp., New York, and H. J. Davis, formerly superintendent of the Clairton steel and coke works of Carnegie-Illinois.

Construction May Lead Recovery, Says R. J. Wysor

YOUNGSTOWN.—Construction may be the bell-wether in the movement toward recovery, R. J. Wysor, president Republic Steel Corp., told branch and district sales managers of Truscon Steel Co. at a meeting here Feb. 22.

"No man knows when the present depression will end, but business may come back much faster than we think," said Mr. Wysor. "If and when it comes, we will be ready to meet a growing demand for construction materials."

Myron A. Wick, president of Truscon, and Charles M. White, vice-president in charge of operations of Republic, were among other speakers at the banquet. Mr. White told of the steps taken to cut operating costs by new production methods.

Earl M. Richards, assistant vice-president in charge of Republic subsidiary operations, and Norman Foy, Republic's general manager of sales, also talked briefly.

Chicago Enamelers Club Plans March 12 Program

CHICAGO.—The Chicago District Enamelers Club has announced the following program for the March 12 meeting of the organization at the Graemere Hotel, Homan and Washington Boulevard, Chicago, at 3 p.m.

"Stabilization of the Reflectance and Color of Re-Coat Enamels," by G. H. McIntyre, director of research, Ferro Enamel Corp., Cleveland.; motion picture to be presented by the Youngstown Sheet & Tube Co., Youngstown; "Application of the Wheelabrator to Enameling Plant Cleaning Problems," by E. B. Rich, the American Foundry Equipment Co., Mishawaka, Ind.

The program committee includes M. E. Manson, chairman, Chicago Vitreous Enamel Product Co., Cicero, Ill.; N. P. Alessi, American Stove Co., Harvey, Ill.; D. W. Armstrong, Benjamin Electric Mfg. Co., Desplaines, Ill., and G. W. Hofstetter, Rohm & Haas, Philadelphia.

Sprout, Waldron & Co., Inc., Muncy, Pa., has appointed the Pittsburgh Gage & Supply Co., 3000 Liberty Avenue, Pittsburgh, as exclusive distributer in the Pittsburgh area of Sprout-Waldron hangers, couplings, pillow blocks and other transmission appliances.

Management of Machine Cutting Operations

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By R. F. HELMKAMP

*Engineer, Applied Engineering Department, Air Reduction Sales Co., New York**

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THE application of machine gas cutting to general manufacturing problems has been relatively slow, since time was required to standardize cutting practice and cull out undesirable procedure. There has been a steady development by countless individuals and industries working with this process to increase its usefulness as applied to their particular problems. Such work has been going on for over a quarter of a century and when we consider that practically all investigations, whether fostered by individuals or industries, were carried on with serious intent to further their own interests, we can readily determine that the background of this process rests on sound engineering information. Other corollary developments in fusion welding further developed the need for a quick, economical and dependable method of forming iron and steel to desired contour.

Problems arise daily in industry that are readily solved by the application of machine gas cutting. The oxy-acetylene process literally presented itself to industry in general, through the back door, with the result that until recent years the shop men knew more of its value and application than the front office, or those in the executive capacity. Engineering organizations have been busy in the past few years analyzing the merits of the process, setting limitations based on investigations and writing codes for the guidance of the users of the process.

Investigate Possibilities Of Applying Machine Gas Cutting

This all brings us to a point where it is suggested that those in an executive capacity investigate the possibility of applying the process to any work under consideration, whether redesign of present products or development of new. Should, for example, a plant executive provide each of his department heads with information available on machine cutting, with the request they study the process and think in terms of applying it to their problems, for a specified period of time, this executive could call a meeting at the expiration of the allotted time and develop many interesting applications of the process. Further study and cost analyses would indicate the course to follow.

The management of machine cutting operations means first an investigation of the practicability of applying the process to the work to be done. This brings up questions such as: What metals can be cut, what effect has gas cutting on the metal, what are the limitations as to thickness, what degree of accuracy can be obtained, are specially trained operators required, what are the cutting speeds, what machines are available and best suited, can production costs be predetermined, how do they compare with present practice and what will be the quality of the work.

The executive in direct charge of mechanical gas cutting operations should be familiar with the answers to these questions or know the proper representatives of the supply companies to contact for further information on specific problems. The services of such individuals are readily obtainable.

What Metals Can Be Machine Cut

The knowledge that most ferrous metals, in general use, can be flame cut is generally understood. Steels under 0.30 per cent carbon can be cut cold, or without heat-treatment before or after cutting. Machine gas cutting of these steels is just as well standardized and just as much a matter of course as their shaping by any other of the accepted machining methods.

Steels in the higher alloy group can also be cut without difficulty. These steels, however, should be preheated before cutting and annealed afterward. When this procedure is followed, there is no more of a problem than with the lower carbon steels.

Certain special alloy steels require a specific technique and procedure to produce satisfactory cut surfaces. Chromium alloys come under this general classification and good results with mechanical cutting may be had on this class of steel with a chromium content in the 4 to 6 per cent range.

Effect of Gas Cutting on Steel

The management of machine cutting operations must consider the effect of flame cutting on the metals to be used. The facts are available to those interested in the metallurgy of it and have been published by various unbiased engineering organizations that have based their findings on numerous studies and analyses.

The results may be briefly summarized, though they have been verified over a long period of time by the experience of those employing the process in accordance with clearly defined correct practice.

Flame cutting has no appreciable effect on the physical and chemical characteristics of the plain or low carbon steels which constitute the bulk of steels used in industry. That is why these steels are cut cold and need no heat-treatment. Alloy steels and large forgings should be annealed and cut hot because of the strains inherent in them incident to the cut surface which results from the longitudinal shrink due to the heat of the cutting process. The correct information as to how to handle such materials should be in the hands of the foreman in charge. With such information and procedure properly understood and applied, results will be consistent and satisfactory.

Annealing Steels with Higher Carbon Contents

Steels over 0.30 per cent carbon tend to have some migration of

*Read at the 38th Annual Convention, International Acetylene Association, Birmingham, Ala., Nov. 10, 11 and 12, 1937.

carbon to the flame-cut surface. When correct practice is followed and these steels are preheated before cutting and annealed afterward, they are just as easy to cut as the lower carbon steels, and can be machined afterward without difficulty. The annealing returns the steel practically to its original state. Extensive researches and tests, both in this country and abroad, have established this fact beyond a doubt.

All plate and forging thicknesses common to industry offer no difficulties to the machine gas cutting process. The oxy-acetylene torch readily and smoothly severs sections far beyond the practical range of cutting by mechanical means.

Accuracy of Flame Cutting

Flame cutting can be relied on for reasonable accuracy. The squareness and clean finish of such cuts, together with the sharp top and bottom edges, compare favorably with rough machining.

The degree of accuracy depends largely on the grade and thickness of the material, and the intricacy of the shape. Where no subsequent machine finish is required, ordinary steel plate or slabs up to about six inches in thickness may be generally cut right to the finish line. On the higher carbon steels and parts which are to be machine finished, only a sufficient tolerance need be left to allow for easy and economical machining. Such predetermined accuracy may be depended on for square edged and bevel cuts, including work of such a nature as double bevel cutting, swinging bevel cutting and the cutting of constant bevels on irregular contours. Considerable work is being done of the nature of cutting in two planes, to which such accuracy also applies.

Allowances for Kerf Width

A simple rule-of-thumb, to apply for machining tolerance when required on thicknesses up to six in., is to allow stock, the equivalent of the kerf of the cutting tip used, for the thickness of metal cut. For thicknesses greater than six in. a tolerance of 1½ to 2 times the kerf width is suggested. As the operator acquires skill he can reduce such tolerances.

Since tolerance varies with the grade of work to be done, it may readily be compensated for by making due allowance on the drawing or templet used in cutting the shapes. The kerf or width of the metal dislodged by the cutting operation is taken care of the same as tolerance. The allowance is normally no more than would be required with other methods.

Cutting Machine Operators

Good machine cutting operators are readily developed from shop mechanics of average intelligence and ability previously trained in metal working. Men selected with the qualification of being conscientious workers with a pride in accomplishment and an interest in mechanical cutting will rapidly pick up the details of flame cutting. The instructions furnished with machine installations and by service representatives are easy to follow and produce results quickly. Make the recommended adjustments to suit the thickness to be cut, as given in the set-up tables, and the rest is largely automatic. With proper procedure you get good results at once, and get them most economically.

Best practice is to train more than one operator so as to avoid temporary stoppage of operations due to illness, promotion or other reasons that would disturb the production schedule of the machine. Apprentices are usually employed as helpers, and thereby further increase the supply of skilled operators. Broadening operations that may require additional machines will then find you with the necessary operators.

Selection of Machines

A study of the nature of the work to be done prompts the selection of the cutting machine or machines best suited. The manufacturers of gas cutting machines are broadening their scope and developing them more along regular machine tool lines so as to provide a selection of machines that are of the general purpose type, production type or highly specialized for specific work. These machines may be further classified as of the stationary, semiportable and portable type. There are machines of these types capable of extending the length of the cutting range indefinitely to that required for shop operations. Some machines are capable of special adaptations to specific operations not as yet common to industry in general. Some of this work is accomplished by special attachments to standard machines. In some cases special machines for special production operations are developed.

From the foregoing it is quite evident to the manager of an industry that can and does use mechanical cutting that the field of application is constantly broadening.

There are various types of driving mechanisms employed on these machines. The selection offers a choice to suit the requirements of the user and the type of work under consideration.

Periodic discussions of machine cutting problems with the representatives of the various companies that distribute mechanical cutting machines will keep interested executives up to the minute on the latest developments of this important process. Considerable progress is being made in the line of additional and specialized machines and industry in general will profit most by keeping well informed on the latest developments.

Predetermining Production Costs

Cutting speeds and gas consumption costs are items that vary, depending on the kind of steel, thickness, intricacy of contour, the quality and finish desired, etc. Set-up and gas consumption tables are furnished, covering steel up to twelve in. thick or more. References to these tables provide reliable estimates on gas consumption and cost as well as actual cutting time. Tip sizes and gas pressures, which represent good cutting practice, are shown in these tables. To assist in the accurate layout of templets, the approximate kerf allowance for the various tip sizes is also shown.

Cutting Costs Estimates

Actual gas consumption costs can be estimated; other cost factors are handling, setting up time and overhead. Hourly overhead is known. Handling and setting up time can be readily determined from a study of the actual job. The sum of gas consumption costs, handling and setting up costs and overhead is the total cost of machine gas cutting.

With dependable estimating data available, work may be estimated on the basis of machine cutting and compared to present practice.

Savings are usually apparent. Consider also the flexibility of the process, the ease and speed of accomplishment, and the dependability, quality and accuracy that machine gas cutting offers.

Years ago the gas cutting machine in a shop was a piece of equipment to take care of the odd job; now it finds itself in the production line and plant management will give careful study to its correct location. Consider the flow of work to and from the machine and don't overlook the all-important matter of adequate handling facilities. Study the capabilities of the machine in use or under consideration and develop all the information possible regarding the regular and out of the ordinary jobs that may be accomplished with it.

The foreman in charge of cutting operations need not be an operator but the more he knows about good cutting procedure the more efficiency he can derive from his machine cutting equipment. Machine cutting tables should be conveniently located to the machine and readily accessible for reference. Once established for the economy and quality of work, such tables should be adhered to, and estimated schedules may be met.

Cutting charts may be supplied by the machine manufacturer, but ofttimes certain work requires a deviation from such outlined tables. Mechanical gas cutting equipment is quite flexible in its adaptation to regular and specific work and therefore it is quite natural for certain industries to develop special charts for their work. The governing factors are economy, quality and mere severing operations as well as special procedure for certain alloys.

Accumulation of Data

The individual in charge of the cutting department will do well to develop and record basic information on special work. Reference to such data upon a recurrence of such jobs saves time and improves cutting practice.

Information should be kept on all types of cutting and if possible the operator should be encouraged to keep a log book of his cutting activities. As time goes on, a wealth of information will be gained from proper log book records, which should be checked, studied and recorded periodically by the department head.

Cutting Procedure

Cutting procedure on the more complicated contours involves correct starting point and direction of travel, proper support of the work piece and the scrapers. The use of tie bars to preserve contours on critical sections should be employed and starting cuts inside the outer contour resorted to for the same reason. Cutting in two planes may be readily accomplished by simple jigs and should be encouraged to further reduce costs and add to the usefulness of the cutting equipment. Bevel cuts may be made on straight lines or irregular contours and double bevel cutting in a single pass is now available to industry. Flame piercing of starting holes in plates, slabs and forgings saves time over drilling, and should be controlled by outlined procedure to the operators. Preheating and annealing practice should be clearly outlined on the class of work done, correct control of this phase of mechanical cutting work is obvious.

Machine Cutting Tips

The cutting tip is the cutting tool; keep it in as good order as the milling cutter, the drill or the lathe tools. You wouldn't blame the lathe if the tool was improperly set or ground and that goes for a cutting tip as well. Use the machine cutting tips in the hand torches when they show signs of affecting the quality of machine cuts. Some plants have a maximum time limit for which cutting tips are used on a machine after which they are replaced. They find it economical and maintain a better standard of quality by such procedure. All such control promotes a more orderly cutting department and results that are more dependable. The personnel feels the cutting department is being required to maintain a higher standard and the correct mental attitude is encouraged in the interest of efficiency.

Drawings and Templets

The matter of drawings for hand tracing or templets for mechanical guidance deserves some consideration. It is our thought that the layout for templets and tracings should be prepared by the drafting department and sent to the cutting department. A qualified mechanic should then lay out and build the templet. When a templet is completed, tried out and proved satisfactory it should be marked by the builder to center the responsibility. The templet should be stamped or marked with the part number of the piece to cut, and also with the tip number, oxygen and acetylene pressure to use as well as the speed of cutting. The templet is a tool to the extent of a jig and should be cared for the same as a jig for future use. With the cutting information for the specific job recorded on the templet the operator loses little time in setting up and starting production.

The engineering department should be familiar with cutting tables and basic machine cutting data for estimating and layout. This will expedite matters in the cutting department.

Why not think in terms of mechanical cutting and make a serious effort to keep up to the minute on what developments are being added to those you are already familiar with? You may not be able to use them all, but with certain information filed away in your mind you may be able to solve some knotty problem at some future time. If you do not use mechanical cutting at present, inform yourself of its usefulness. Get acquainted with it as well as you can under such circumstances as will permit. Mechanical cutting is being done more and more. Really, the use of the process has just recently seriously interested industry. More machines will make their appearance; they will follow in a sense the machine tool development, that is, special machines for special jobs. High production on certain jobs warrants such development and progress means constant improvement.

Mechanical gas cutting has an enviable background in up-to-date industry. The present stage of dependability and usefulness is the result of earnest effort to put to use a process that has progressed beyond the laboratory stage and proved its advantages over a period of time. It is so simple, so flexible, so economical, that compared with conventional standard practice, it antiquates production methods in vogue, revolutionizes shop practice and flings the door wide open to lower operating costs.

Industrial Machinery Exports Gain 36%
Power Generating Equipment Sharply Up

WASHINGTON.—United States exports of industrial machinery in January totaled $22,456,168, representing a gain of 36 per cent over the corresponding shipments a year ago, valued at $16,530,765, according to the Machinery Division, Department of Commerce.

Overseas consignments of power-generating machinery during the month were 194 per cent greater than a year ago, totaling $3,529,422 compared with $1,200,987. Most of this gain was recorded in locomotives shipped abroad to the value of $2,147,500 compared with $176,591 a year ago, and in engines over 10-hp. (other than diesel) in which the exports advanced to $515,260 against $77,981 in January, 1937. Sales of steam specialties also gained to $160,556 as compared with $99,112 last January.

Foreign sales of construction and conveying machinery totaled $1,934,184, an increase of 61 per cent over the $1,201,130 exported during January, 1937.

Export sales of mining, well, and pumping machinery during the month aggregated $4,597,388, a gain of 1 per cent over the January, 1937, shipments valued at $4,565,500. Exports of power-driven metal-working machinery totaled $5,968,604, an increase of 38 per cent over the corresponding shipments in 1937 valued at $4,314,629. While most all types of this equipment contributed to the gain, the outstanding increases were recorded in rolling-mill machinery, valued at $1,061,003 compared with $251,836 a year ago; knee and column type milling machines, $447,522 against $221,431; engine lathes, $601,088—$256,935; turret lathes, $414,747—$259,696; other lathes, $276,880—$139,076; internal grinding machines, $237,360—$110,853; other grinding machines (except surface and external cylindrical), $374,492—$214,598. Exports of other metal-working machinery were valued at $297,761, a gain of 10 per cent over the $270,877 shipments a year ago. Foreign sales of textile, sewing, and shoe machinery were slightly higher than a year ago, valued at $1,793,351, an increase of 18 per cent over the $1,521,518 shipments of January, 1937.

Shipments abroad of all other types of industrial machinery in January advanced to $4,335,458, a 25 per cent gain over the shipments a year ago valued at $3,456,124. Important improvements were recorded in sales of bakery machinery valued at $50,668 against $27,839; cigarette and other tobacco machinery, $107,674 against $59,388; blowers and ventilating machinery, $78,650 against $35,779; air compressors, $347,245 against $254,008; refrigerating equipment, $138,520 against $48,147; bottling machinery, $205,360 against $65,929; and iron and steel body valves, $332,969 against $175,845.

NLRB Orders Company to Reinstate 200 Workers

WASHINGTON.—The National Labor Relations Board has issued a cease and desist order against the Titan Metal Mfg. Co., of Bellefonte, Pa., directing the company to reinstate 200 former workers and to abolish the Titan Employees Protective Association as a collective bargaining organization.

The NLRB announcement said that the 200 discharged employees struck on Jan. 15 because of the concern's alleged anti-union activities. The board ruled that workers hired since the strike would have to be dismissed, if necessary, to make room for the striking employees.

The order also directed the company to end alleged interference with the self-organization of employees and to post compliance notices throughout the plant for one month. A petition from an AFL union charging failure to bargain collectively with its members was dismissed at the same time by the NLRB because of "inadequate evidence."

Supreme Court Decision Further Strengthens NLRB

WASHINGTON. — Reversing lower court decisions, the Supreme Court on Monday held that the National Labor Relations Board may compel an employer to withdraw recognition for collective bargaining from a labor organization without at the same time ordering recognition of another union. The decision, which was unanimous, without Justices Cardoza and Reed participating, was read by Justice Stone, and dismissed contentions of the Pennsylvania Greyhound Lines, Inc., and the Pacific Greyhound Lines, Inc., that the cases were "moot" — without legal controversy.

The NLRB had issued orders directing the Greyhound Lines to withdraw recognition from labor organizations which the board said were dominated and controlled by the companies, but did not certify any other organizations as agencies for collective bargaining.

ICC Order to Pool Iron Ore Traffic Upheld by Court

WASHINGTON.—The Supreme Court on Monday affirmed a decision of the Michigan Federal Court approving orders of the Interstate Commerce Commission authorizing pooling of iron ore traffic from the Menominee range in Michigan and Wisconsin to Escanaba, Mich., by the Chicago & Northwestern and the Chicago, Milwaukee, St. Paul & Pacific Railroads.

COMING CONVENTIONS

March 9—Regional meeting, American Society for Testing Materials, Seneca Hotel, Rochester, N. Y. The society's secretary is C. L. Warwick, 260 South Broad Street, Philadelphia.

March 9 to 12—American Society of Tool Engineers, Machine and Tool Progress Exposition, Convention Hall, Detroit. Ford R. Lamb, executive secretary, 5928 Second Boulevard, Detroit.

March 10 to 11—Aeronautic meeting, Society of Automotive Engineers, Mayflower Hotel, Washington. John A. C. Warner, 29 West 39th Street, New York, is secretary.

March 21 to 25—Western Metal Exposition and Congress, Pan-Pacific Auditorium, Los Angeles, sponsored by the American Society for Metals and 17 other technical societies. Information may be secured from W. H. Eisenman, secretary, A.S.M., 7016 Euclid Avenue, Cleveland.

March 25—Gray Iron Founders' Society, Inc., Hotel Statler, Buffalo. Details may be secured from W. W. Rose, executive vice-president, 1010 Public Square Building, Cleveland.

April 25 to 27—American Gear Manufacturers Association, General Brock Hotel, Niagara Falls, Canada. J. C. McQuiston, secretary, Penn-Lincoln Hotel, Wilkinsburg, Pa.

May 3 to 4—American Steel Warehouse Association, Inc., Waldorf-Astoria Hotel, New York. W. S. Doxsey, 422 Terminal Tower, Cleveland, is secretary of the association.

May 14 to 19—American Foundrymen's Association, annual convention, Cleveland. Secretary of the association is D. M. Avey, 222 W. Adams Street, Chicago.

June 27 to July 21—Annual meeting American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, N. J. C. L. Warwick, 260 South Broad Street, Philadelphia, is secretary of the society.

Automobile Plant Employment Gain; March Schedules Stepped Up

The following telegram supplements information regarding automotive developments in the Assembly Line, on page 62 this issue.

DETROIT.—Increase in employment in 23 major automotive plants in Detroit was shown Monday by figures presented to the Common Council by G. R. Harris, welfare superintendent. Twenty thousand men have been put back to work on part time basis since Feb. 7 and approximately 30,000 since Jan. 27, he asserted. Employment in the one-month period has jumped from 62,000 to 92,823. Normal employment in these plants is 250,012, he said. In addition, the welfare superintendent reported that there has been some increase in number of hours worked each week by employees.

Although operating only three days a week, Plymouth in recent weeks has had enough orders booked to warrant four days a week operation of its assembly line. So far it has held back to let orders pile up high enough to assure steady full time operation later in the spring. However, Plymouth and Chrysler as a whole are returning production departments to a four-day schedule and probably will operate 16 days during March as compared with 12 during February. Office workers may return to a 5-day schedule next week.

General Motors Ternstedt Division has pushed its March schedule to 14 days production compared with 10 days last month.

Navy Awards Steel For Destroyers

WASHINGTON. — The Navy Department has awarded 3625 tons of steel for four destroyers now building at Navy Yards, as follows:

Central Iron & Steel Co., 2010 tons of medium black and galvanized plates; Worth Steel Co., 210 tons of black and galvanized plates; Alan Wood Steel Co., 527 tons of high tensile plates, sheets and strips; Lukens Steel Co., 258 tons of high tensile plates, sheets and strips; Thomas Gregory Galvanizing Works, New York, 196 tons of galvanized high tensile shapes and 114 tons of galvanized bars and strips; Jones & Laughlin Steel Corp., 130 tons of galvanized bars and strips; Carnegie-Illinois Steel Corp., 180 tons of black and galvanized shapes.

The Navy Department has issued a schedule calling for bids on March 18 for 627 tons of forgings for shafting for the battleships North Carolina and Washington, building at the Brooklyn and Philadelphia Navy yards, respectively.

Baruch Blames Administration For Depression

BERNARD M. BARUCH, friend and adviser of President Roosevelt, placed the blame for the business slump on policies of the Washington Administration in testifying before the Senate Committee on Unemployment on Monday.

If the Administration's policy remains what it has recently appeared to be, "there is no hope for reemployment and substantial recovery," Mr. Baruch said.

"I have heard some public men reproach business for the alleged failure to step forward and employ the millions of jobless and intimate that, if business doesn't, Government will. In addition to being illogical and unfair, that raises hopes that can never be realized and expresses a promise to unfortunates that can never be fulfilled.

"I say that with regret, but I would be less than candid if I failed to express my opinion that *unemployment is now traceable more directly to Government policy than to anything that business could or should do, and that if those policies are not changed, neither business nor Government can ever solve the most terrible of our problems.*"

Hearings on Scrap Bills Postponed Until April 5

WASHINGTON. — The Senate Military Affairs Committee announced on Tuesday that the public hearings on scrap licensing legislation scheduled to begin March 8 have been postponed until April 5.

Senator Thomas, Democrat, of Utah, chairman of the sub-committee considering the proposals, said the delay was requested by Louis J. Brann, of the Independent Iron and Steel Producers Committee, and Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel.

At the same time, the committee announced it would proceed as scheduled on March 8 with its inquiry relating to strategic and critical raw materials.

PERSONALS

(CONTINUED FROM PAGE 93)

and rolling mills at the Brier Hill plant. He formerly was employed at the South Side plant of Jones & Laughlin Steel Corp., Pittsburgh.

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EDGAR A. FISHER has been appointed general budget director of the appliance engineering department of the Frigidaire division of General Motors Corp., Dayton, Ohio. F. H. MCCORMICK has been appointed manager of the appliance engineering department.

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CHESTER C. BOLTON, of Cleveland, has been elected a director of Lamson & Sessions Co., Cleveland bolt and nut manufacturer, to fill the vacancy created by the death of John G. Jennings.

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OTTO MILLER, senior partner of the investment firm of Hayden-Miller Co., has been elected a director of Otis Steel Co., Cleveland, to fill the vacancy created by the death of Frank H. Ginn.

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CLAYTON S. COGGESHALL has been made general assistant to R. B. BEALE, manager of the turbine division, central station department of the General Electric Co. He was formerly manager of sales of the turbine division, Lynn (Mass.) River works. JOHN L. KERR, previously turbine specialist in the Central district, has taken Mr. Coggeshall's place at Lynn, and ROBERT S. NEBLETT has become manager of sales, Schnectady section, turbine division.

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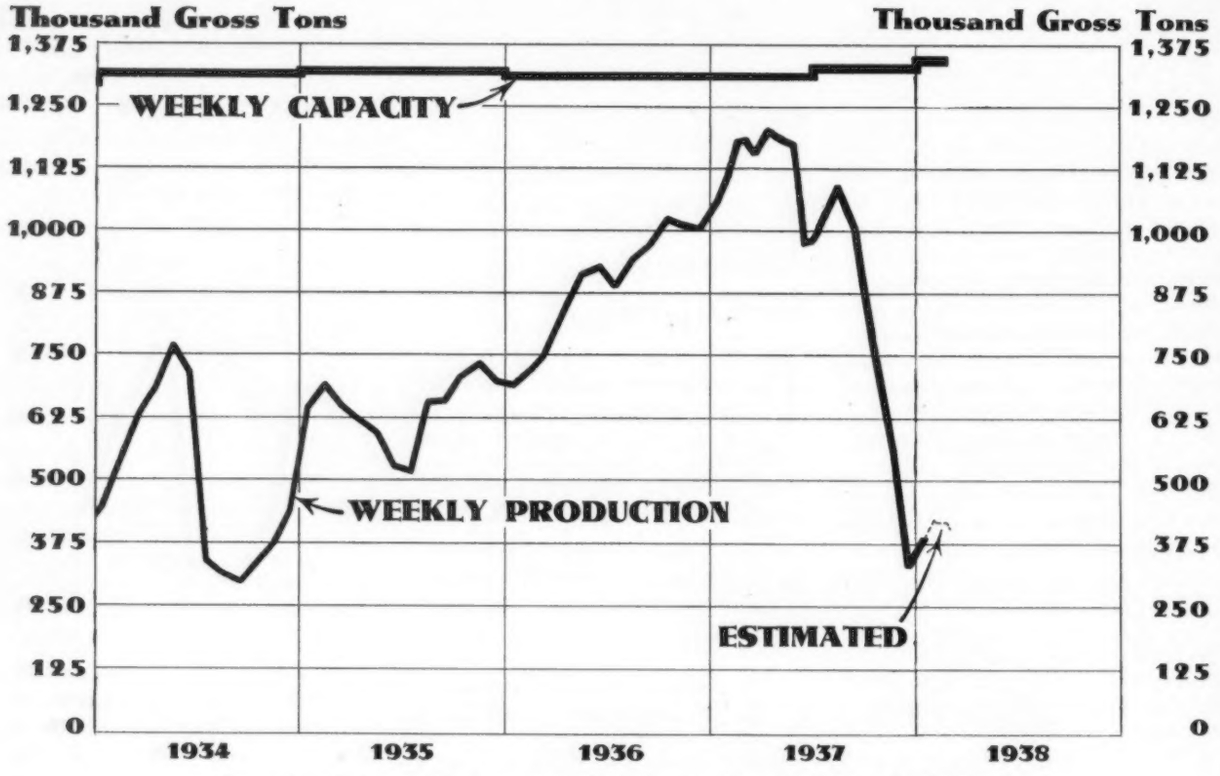
KEMP G. FULLER has been appointed manager of market research and sales statistics, United States Steel Corp. of Delaware. He formerly held this same position with Carnegie-Illinois Steel Corp. Mr. Fuller was graduated from Dartmouth in 1921, after which he took a post-graduate course in business administration. He went to Carnegie-Illinois March 1, 1937, previous to which time he was in the utility management field for 14 years.

PRODUCTION

Average Weekly Production of Open-Hearth and Bessemer Steel Ingots by Months, 1933-1937, and Estimated Production by Weeks in 1938



Figures for the Current Week Are Not Indicated on the Chart Until the Following Week

STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

	Current Week	Last Week
Pittsburgh	27.0	28.0
Chicago	28.0	25.5
Valleys	31.0	30.0
Philadelphia	29.0	29.0
Cleveland	25.0	25.0
Wheeling	50.0	48.0
Buffalo	20.5	20.5
Detroit	33.0	39.5
Southern	40.5	43.5
S. Ohio River	43.5	31.5
Western	30.0	30.0
St. Louis	33.0	27.0
Eastern	50.0	50.0
Aggregate	30.0	30.0

Weekly Booking of Construction Steel

	Week Ended				Year to Date	
	Mar. 1, 1938	Feb. 21, 1938	Feb. 1, 1938	Mar. 2, 1937	1938	1937
Fabricated structural steel awards	6,900	12,770	18,400	10,700	101,075	229,145
Fabricated plate awards	3,960	2,650	9,075	1,845	24,655	28,265
Steel sheet piling awards	0	210	0	2,100	2,605	14,650
Reinforcing bar awards	2,160	8,375	6,955	2,380	39,580	33,195
Total Lettings of Construction Steel	13,020	24,005	34,430	17,025	167,915	305,255

. . . .SUMMARY OF THE WEEK. . . .

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. . . Ingot rate unchanged at 30% as steel buying gains.

o o o

. . . General outlook brighter for consuming industries.

o o o

. . . Scrap market weakens with Iron Age composite off 9c.

STEEL manufacturers this week found many signs of improvement in business, although maintenance of the national ingot production rate at 30 per cent, unchanged from last week, suggests that increased buying of some steel products is not yet substantial enough to indicate a definite uptrend is near.

Nevertheless, sales offices in many steel-consuming areas find a better feeling among consumers, and actual buying for February shows gains ranging as high as 30 per cent above January.

Four of the nine principal steel-producing districts this week scheduled higher rates of production, as a result of the improved buying, while two districts reported a decline and three were unchanged. The districts gaining were Chicago, up two and one-half points to 28 per cent, Youngstown up a point to 28 per cent, Wheeling-Weirton up two points to 50 and southern Ohio 12 points higher at 50 per cent. The Pittsburgh district at midweek was down a point to 27 and Birmingham was three points lower at 40½ per cent.

More significant than the inability of the steel industry's operating rate to rebound in the first week of March are the fair prospects for revision of the controversial undistributed profits tax, a breaking of the used car jam, a favorable freight rate decision by the Interstate Commerce Commission (an 11 per cent increase is forecast) and rather strong indications that the Administration at Washington is prepared to call a truce at least until after the November elections in efforts to pass new legislation opposed by industry.

STILL more tangible evidence supporting hope for a spring recovery in steel demand is the recall of 20,000 idle automobile workers at Detroit and plans by some automobile makers, such as Plymouth, to lift operating schedules from three days at present to four days a week. Vigorous efforts by the automobile industry, a leading outlet for steel, to break the business recession, accompany reports that buying of new and used cars is now showing improvement.

The railroad industry, which for some months has kept its purchases of rails and other equipment as low as possible, is already entering the market in a small way and is awaiting a formal ICC announcement of a freight rate advance to buy steel in quantities certain to be reflected substantially in steel plant operating rates. By mid-March orders for as much as 30,000 tons of rails are expected to be placed. Canadian National railways has just bought 1300 box cars from two Canadian companies.

Whether the building industry will soon be able to free part of its pent-up demand for steel depends in part on whether disagreement over labor rates, particularly in New York State and in the Chicago area, can be settled. Structural steel lettings declined this past week to 6900 tons from 12,770 tons a week earlier, the awards being headed by 925 tons for a power house and spillway bridge at Radford, Va. Bids were to be opened this week on a 2000-ton Columbia River bridge project at Lewiston, Idaho. A Scranton, Pa., hospital has taken 800 tons and three hospital projects in Pennsylvania and New York will require a total of 2500 tons of steel.

The New York City Department of Water Supply has awarded a contract for 2760 tons of welded pipe to a division of the American Locomotive Co. Meanwhile tin plate demand, reflected in heavier mill schedules, is increasing, particularly for export. However, total exports of iron and steel products (excluding scrap) from the United States during January are reported at 229,565 tons, against 306,647 tons in December and 128,843 tons in January of last year. Declines in tin plate, ingot and rail shipments accounted for the January drop.

With pig iron prices reaffirmed for the second quarter, and steel consumers for the most part supporting the steel industry's move in keeping steel prices unchanged for that period, scrap prices have weakened, THE IRON AGE composite declining 9c. a ton to $13.58.

. . . PITTSBURGH . . .

. . . District operations off point but Wheeling-Weirton gains.

o o o

. . . February bookings range 5 to 25% above January's.

o o o

. . . Some mills find rate of upswing less than anticipated.

PITTSBURGH, March 1.—Steel ingot output in the Pittsburgh district this week is down one point to 27 per cent of capacity, while the Wheeling-Weirton rate is up two points to 50 per cent. Individual operations continue highly irregular, with some companies working down stocks of steel and others building them up slightly.

Incoming business during February in the aggregate ranged from 5 to 25 per cent above January bookings, depending on the company and products involved, but tonnages for both months were not large. During the latter part of February new orders were coming in at a much slower rate than earlier in the month, and this trend continues. Little or no improvement during the past week has been noted in semi-finished steel, bars, sheet and strip demand. However, increased wire sales and the pick up in tin plate specifications are evident. In fact, seasonal requirements have resulted in a step-up in tin plate operations from 45 to 54 per cent.

Opinion regarding the immediate outlook for steel is somewhat divided, but there appears to be a well defined feeling that March business will be more active than during the past month. On the other hand, disappointment has been felt over current business as the rate of improvement has been slower than was anticipated.

Pig Iron

Little or no change in the volume of new business occurred during the past week. A tendency towards slightly larger day to day purchases, however, is evident. Consumer stocks are exceptionally low but no sharp increase in buying is expected in the near future.

Semi-Finished Steel

February bookings on a daily basis were about on a par with January business. Demand during the past week if anything was slightly less active than a week ago. Hand-to-mouth buying continues with customers ordering only absolute necessities.

Bars, Plates and Shapes

Hot-rolled bar demand continues at low ebb with current bookings mostly for fill-in requirements. Automotive purchases are lacking and miscellaneous orders are spotty. Structural plate and shape demand is slightly better than a week ago but tonnages placed are not large. Inquiries and awards have slackened up some during the past few weeks with a definite absence of privately financed projects.

Reinforcing Bars

Inquiries and awards have slowed up somewhat during the past few weeks. However, a substantial amount of tonnage is pending. Largest inquiry is for 1150 tons for a sewage disposal plant at Baltimore.

Cold Finished Bars

Cold-finished bar demand continues at low ebb with new automotive business at a virtual standstill. Miscellaneous specifications have slackened and remain spotty.

Tin Plate

Regular seasonal influences have resulted in a pick up in specifications during the past few weeks. Some export business has been placed recently including requirements for the pineapple pack. Releases have also increased. Tin plate operations may be estimated at 54 per cent, up nine points from last week.

Sheets and Strip

Aggregate business is no better than a week ago but a slightly better diversification of orders is evident. This latter condition suggests further working down of miscellaneous inventories. Automotive buying continues at recent low levels with no immediate change expected. Hot-rolled strip demand continues spotty and has not improved from recent levels.

Wire

Although demand for manufacturers' wire is no better than a week ago, a further increase in merchant wire bookings has been noted. Specifications for wire fencing have increased somewhat during the past few weeks. Producers expect the spring buying movement to get under way as soon as jobbers' stocks in most sections of the country are exceptionally low. Price irregularities are restricted to secondary markets and mill quotations are firm.

Tubular Goods

Total pipe sales during the past week are off slightly from a week ago. Mills, however, are still replenishing warehouse stocks. February business on a daily basis was about on a par with January orders.

Coal and Coke

The suspension of soft coal prices by the National Bituminous Coal Commission has added some confusion to the local market. However, industrial coal demand has been exceptionally spotty during the past several weeks and no immediate effect of any consequence is anticipated. Meanwhile, market conditions revert to those previously in effect before the commission set prices.

Fairbanks, Morse Gets $1,750,000 Navy Job

FAIRBANKS, MORSE & CO., Beloit, Wis., has received contracts aggregating $1,750,000 for ship service equipment for two new United States battleships.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	Mar. 1, 1938	Feb. 21, 1938	Feb. 1, 1938	Mar. 2, 1937
Rails, heavy, at mill	$42.50	$42.50	$42.50	$39.00
Light rails, Pittsburgh	43.00	43.00	43.00	38.00
Rerolling billets, Pittsburgh	37.00	37.00	37.00	34.00
Sheet bars, Pittsburgh	37.00	37.00	37.00	34.00
Slabs, Pittsburgh	37.00	37.00	37.00	34.00
Forging billets, Pittsburgh	43.00	43.00	43.00	40.00
Wire rods, Nos. 4 and 5, P'gh	47.00	47.00	47.00	43.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	2.10	2.10	2.10	1.80

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	2.45	2.45	2.45	2.20
Bars, Chicago	2.50	2.50	2.50	2.25
Bars, Cleveland	2.50	2.50	2.50	2.25
Bars, New York	2.79	2.79	2.79	2.55
Plates, Pittsburgh	2.25	2.25	2.25	2.05
Plates, Chicago	2.30	2.30	2.30	2.10
Plates, New York	2.54	2.54	2.54	2.33
Structural shapes, Pittsburgh	2.25	2.25	2.25	2.05
Structural shapes, Chicago	2.30	2.30	2.30	2.10
Structural shapes, New York	2.5125	2.5125	2.5125	2.3025
Cold-finished bars, Pittsburgh	2.90	2.90	2.90	2.55
Hot-rolled strips, Pittsburgh	2.40	2.40	2.40	2.15
Cold-rolled strips, Pittsburgh	3.20	3.20	3.20	2.85
Hot-rolled annealed sheets, No. 24, Pittsburgh	3.15	3.15	3.15	2.80
Hot-rolled annealed sheets, No. 24, Gary	3.25	3.25	3.25	2.90
Sheets, galv., No. 24, P'gh	3.80	3.80	3.80	3.40
Sheets, galv., No. 24, Gary	3.90	3.90	3.90	3.50
Hot-rolled sheets, No. 10, Pittsburgh	2.40	2.40	2.40	2.15
Hot-rolled sheets, No. 10, Gary	2.50	2.50	2.50	2.25
Cold-rolled sheets, No. 20, Pittsburgh	3.45	3.45	3.55	3.25
Cold-rolled sheets, No. 20, Gary	3.55	3.55	3.65	3.35
Wire nails, Pittsburgh	2.75	2.75	2.75	2.50
Wire nails, Chicago dist. mill	2.80	2.80	2.80	2.55
Plain wire, Pittsburgh	2.90	2.90	2.90	2.60
Plain wire, Chicago dist. mill	2.95	2.95	2.95	2.65
Barbed wire, galv., P'gh	3.40	3.40	3.40	3.05
Barbed wire, galv., Chicago dist. mill	3.45	3.45	3.45	3.10
Tin plate, 100-lb. box, P'gh	$5.35	$5.35	$5.35	$4.85

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Pig Iron

Per Gross Ton:	Mar. 1, 1938	Feb. 21, 1938	Feb. 1, 1938	Mar. 2, 1937
No. 2 fdy., Philadelphia	$25.84	$25.84	$25.84	$23.76
No. 2, Valley furnace	24.00	24.00	24.00	22.00
No. 2, Southern Cin'ti	23.89	23.89	23.89	21.69
No. 2, Birmingham†	20.38	20.38	20.38	18.38
No. 2, foundry, Chicago*	24.00	24.00	24.00	22.00
Basic, del'd eastern Pa.	25.34	25.34	25.34	23.26
Basic, Valley furnace	23.50	23.50	23.50	21.50
Malleable, Chicago*	24.00	24.00	24.00	22.00
Malleable, Valley	24.00	24.00	24.00	22.00
L. S. charcoal, Chicago	30.24	30.24	30.24	27.54
Ferromanganese, seab'd, carlots	102.50	102.50	102.50	80.00

†This quotation is subject to a deduction of 38c. a ton for phosphorus content of 0.70 per cent or higher.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	*$13.75*	$14.00	$14.25	$21.75
Heavy melting steel, Phila.	14.75	14.75	14.75	18.75
Heavy melting steel, Ch'go	12.25	12.25	13.00	20.25
Carwheels, Chicago	14.00	14.00	15.50	19.50
Carwheels, Philadelphia	15.25	15.25	15.75	18.50
No. 1 cast, Pittsburgh	*15.75*	16.25	16.25	18.75
No. 1 cast, Philadelphia	15.75	15.75	16.25	19.25
No. 1 cast, Ch'go (net ton)	11.75	11.75	12.50	17.00
No. 1 RR. wrot., Phila.	15.25	15.25	15.75	18.75
No. 1 RR. wrot., Ch'go (net)	9.75	9.75	10.75	18.50

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$4.00	$4.00	$4.00	$4.25
Foundry coke, prompt	5.00	5.00	5.00	4.50

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn.	10.00	10.00	10.00	15.00
Lake copper, New York	10.125	10.125	10.125	15.12½
Tin (Straits), New York	41.875	41.875	40.875	54.75
Zinc, East St. Louis	4.75	4.75	5.00	6.80
Zinc, New York	5.10	5.10	5.35	7.15
Lead, St. Louis	4.35	4.35	4.75	6.85
Lead, New York	4.50	4.50	4.90	7.00
Antimony (Asiatic), N. Y.	*15.75*	15.875	15.625	16.50

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
March 1, 1938	2.605c. a Lb.	$23.25 a Gross Ton	$13.58 a Gross Ton
One week ago	2.605c.	23.25	13.67
One month ago	2.605c.	23.25	14.00
One year ago	2.330c.	21.25	20.25

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1938					$14.00, Jan. 4	$13.67, Feb. 21
1937	2.605c., Mar. 9	2.330c., Mar. 2	$23.25, Mar. 9	$20.25, Feb. 16	21.92, Mar. 30	12.92, Nov. 16
1936	2.330c., Dec. 28	2.084c., Mar. 10	19.73, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.130c., Oct. 1	2.124c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 23
1934	2.199c., Apr. 24	2.008c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	2.015c., Oct. 3	1.867c., Apr. 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., Apr. 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 17	13.08, Nov. 22

REINFORCING STEEL

. . . Awards of 2160 tons—3550 tons in new projects.

AWARDS

Rochester, N. H., 100 tons, high school, to Northern Steel Co., Boston.

Norristown, Pa., 275 tons, State hospital, to Ceco Steel Products Corp., Omaha, Neb.

Laurelton, Pa., 200 tons, State village, part 2, to Milton Mfg. Co., Milton, Pa.

Wernersville, Pa., 200 tons, State hospital, to American Steel Engineering Co., Philadelphia.

Allentown, Pa., 200 tons, hospital, to Bethlehem Steel Co., Bethlehem, Pa.

East Stroudsburg, Pa., 160 tons, college building, to Bethlehem Steel Co., Bethlehem, Pa.

Hancock, Md., 625 tons, bridge over Potomac River, to Bethlehem Steel Co., Bethlehem, Pa.

Chillicothe, Ohio, 210 tons, Veterans' Hospital, to Pollak Steel Co., Cincinnati, through James I. Barnes Construction Co., Springfield, Ohio.

Chicago, 1040 tons, Sears-Roebuck & Co. store, to Jos. T. Ryerson & Son, Inc., Chicago.

St. Louis, 190 tons, addition to bottling plant of Griesedieck Brothers Brewery Co., to Missouri Rolling Mill Corp., St. Louis.

NEW REINFORCING BAR PROJECTS

Cynwyd, Pa., 300 tons, junior high school.

Baltimore, Md., 1150 tons, back river sewage disposal plant.

Washington, 105 tons, St. Elizabeth Hospital; John McShane, Baltimore, low bidder on general contract.

Patrick County, Va., 125 tons, viaduct.

Palo Pinto County, Tex., 5000 tons, Possum-Kingdom Dam, Brazos River Valley flood control; on new billet bars, Sheffield Steel Corp., Kansas City, low bidder; on straight rail bars Texas Steel Co., Fort Worth, Tex., low bidder; on bent rail bars Laclede Steel Co., St. Louis, low bidder (three bids called for).

Springfield, Ill., 190 tons, telephone building.

Ames, Iowa, 125 tons, high school.

Port Huron, Mich., 300 tons, International bridge plazas.

State of Wisconsin, 160 tons, eight bridges; bids March 4.

Chicago, 350 tons, foundations for Soldier Field addition; bids in.

Chicago, 100 tons, coke oven floor, Wisconsin Steel Co.

Cicero, Ill., 325 tons, overhead crossing; bids in.

Jefferson City, Mo., 100 tons, power house at Missouri State prison; bids rejected. New bids will be asked March 29.

San Francisco, 100 tons, St. Philip's school.

Hamilton, Mont., 109 tons, dam at West Ford Bitteroot storage project; bids March 4.

San Diego, Cal., 103 tons, State highway project; bids March 17.

RAILROAD BUYING

Canadian National has ordered the following 45-ton box cars: 700 from Eastern Car Co., 700 from National Steel Car Corp. and 600 from Canadian Car & Foundry Co.

Eastern Gas & Fuel Associates are taking bids on 50 hopper cars.

Shell Chemical Co. has placed an order for four tank cars with General American Transportation Corp.

Canfield Tank Line has ordered four tank cars from General American Transportation Corp.

Chicago, Rock Island & Pacific has been authorized to lease eight 100-ton and two 125-ton diesel switching locomotives from Electro-Motive Corp. for a period of seven years at a gross rental of $67,500 for the smaller locomotives and $88,000 for the larger. The road may purchase the locomotives at the end of the seven-year period if it so desires.

Association of American Railroads announces that Class I railroads and the Pullman Co. on Jan. 1, this year, had 11,168 air-conditioned passenger cars in operation. Of that number 6407 were owned by Class I railroads and 4761 by the Pullman Co. In 1937 air-conditioning devices were installed on 3090 passenger cars, of which 2481 were owned by the railroads and 609 by the Pullman Co. This equipment included sleeping cars, lounge cars, and other classes of passenger cars.

RAILS AND TRACK SUPPLIES

Bangor & Aroostook has placed orders for 2890 tons of rails, 1940 tons with Bethlehem Steel Co. and 950 tons with Carnegie-Illinois Steel Corp.

Non-Ferrous Defects Described by Tour

"DEFECTS in Non-Ferrous Castings, Their Causes and Cures," was the subject of a talk delivered by Sam Tour, Lucius Pitkin, Inc., at the monthly meeting of the Metropolitan chapter of the American Foundrymen's Association, held at the Essex House, Newark, N. J., on Feb. 21.

In the discussion that followed interest was shown in a rubber core wash described by the speaker as giving a particularly fine surface finish and at the same time keeping core blow defects at a minimum.

S. Frankel, H. Cramer & Co., was elected treasurer of the chapter, and the following were elected to the board of directors: J. Clark, Crucible Steel Co. of America; E. Cook, American Brake Shoe & Foundry Co., N. A. Kahn, Pratt Institute, and W. A. Phair, THE IRON AGE.

Mesta's Orders Exceed $13,000,000

MESTA MACHINE CO., Pittsburgh, manufacturer of rolling mills and other heavy equipment for steel plants, had unfilled orders totaling $13,074,460 at the close of 1937, Lorenz Iversen, president, said in his annual report to shareholders. This compares with a total of $14,363,088 a year earlier.

"Considering the volume of business carried over from last year and the amount of miscellaneous orders currently being received, I believe that 1938 will be a satisfactory year," Mr. Iversen said.

Mesta's net earnings last year were $4,668,029 or $4.67 a share, against $4,266,964, or $4.26 a share of common in 1936.

Ohio State University Promotes Research

"INVENTIONS and Patents" is the title of a pamphlet issued by the Ohio State University Research Foundation embodying the first of a series of lectures dealing with research and invention. This pamphlet reproduces the address made at Ohio State by Harry A. Toulmin, Jr., of the firm of Toulmin & Toulmin, patent lawyers, Dayton, Ohio.

The Ohio State University Research Foundation is a relatively new development organized about a year ago. Its purpose is to bring to the campus leaders of thought in various fields, with particular reference to the progress of industry through invention and research. Lectures are a part of the service provided by the foundation, in addition to the provision of facilities for cooperative research with industry.

Republic Steel Reduces Office Staff to Five Days

CLEVELAND. — Following the policy recently announced by other leading steel companies, Republic Steel Corp. has placed in effect a reduction in working hours with a corresponding reduction in income for office employees. The working week has been reduced from five and one-half days to five days with a loss of pay for the half day. While salary rates are not reduced by the cut in hours, the weekly income of the office employees is cut approximately 9 per cent.

. . . . CHICAGO . . . .

. . . District ingot production finally turns upward

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. . . March demand expected to exceed prior two months.

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. . . Scrap prices dip ends on higher melting rate prospects.

CHICAGO, March 1.—The rate of ingot output in this district is up two and a half points to 28 per cent of capacity this week. Gains of two district mills have offset the decrease of a third producer. The increase at one plant is occasioned by the need to building up semi-finished stock for merchant mills and the 60 per cent operation there is expected to be maintained for at least a week and possibly longer.

A more optimistic outlook is being expressed in the trade here than has been evident for some time. Tangible explanations are difficult to obtain, however, since few sales offices can report an increase in February over January. In one office, however, sales on Monday of this week were running about 30 per cent ahead of January, in spite of the short month, and another mill stated that February would have equaled January if on a 31-day basis.

March is universally expected to show a considerable gain over the first two months of 1938 and one leading producer anticipates the best month since October last year. A large share of the new business already in as well as that expected is resulting from the release of orders held back because of price uncertainties. A marked change is reported in the attitude of many purchasing agents and other executives of consuming companies. The Milwaukee office of one major steel company reported last week the best so far in 1938.

Railroad buying is again assuming important proportions, it being estimated that close to 30,000 tons of rail and accompanying accessories will have been placed by the middle of March, some already being on the books. Inquiries for new equipment are not yet prominent but a great deal of interest in this direction is expected if a favorable rate decision is received.

After years of depression caution, the building industry here, eager to go to work, is still in the doldrums with high costs, chiefly labor, getting the blame. Considerable construction work is said to be in prospect but backers and contractors apparently can find little incentive to proceed at present cost levels.

One of the best weeks since late in the fall is reported from the tin mills of one major producer in this district, the schedule calling for 18 turns or six days of three 8-hr. turns each.

Scrap prices are leveling off after several weeks when quotations were reduced and an upward trend in mill operations may soon be reflected in scrap. No. 1 is quoted at $12 to $12.50.

Pig Iron

Shipping releases against old contracts are being received in slightly greater number and, although the upward movement is far from being pronounced, there is nevertheless a hopeful feeling existent with regard to March business. Automobile melters do not figure in the increase, general jobbing foundries being the most important factor.

Bars

Demand for bars in this district cannot be great as long as automobile buying continues so poor. A slight increase in the business being received, however, was seen last week as a result of higher specifications from implement manufacturers, whose orders throughout the winter and fall have constituted a large share of the business on bar mills. One mill here reports a slight rise in demand from makers of machinery and tools.

Sheets

There still being little interest expressed from Detroit, sheet mills continue to operate at low levels. Stove and refrigerator buying is unimportant also whereas general jobbing demand and farm equipment makers specifications are providing occasional stimuli.

Warehouse Business

February orders were less than for the same period last year, although about the same as January this year, according to a leading jobber. Demand continues well diversified, and in obviously fill-in quantities. It was thought by some that the second quarter price announcements would cause a return to buying in mill lots, since the fear of possible inventory loss is greatly eliminated but the past few weeks have seen an increasing number of small orders from buyers who ordinarily go to a mill. Volume is expected to increase during March.

Structural Shapes and Reinforcing Bars

An award of 1040 tons of bars to Ryerson for a Sears, Roebuck & Co. building here is the outstanding award this week. Inquiries generally are insignificant, no new projects of size having been announced.

Wire and Wire Products

Consumption of these products is practically unchanged, demand from the farm areas and industrial consumers showing no significant improvement. Rural buying is expected during March, however, if it is to be seen at all, but at the moment buyers are marking time and orders continue in fill-in quantities.

Rails

Although no formal announcements have been made, inquiries of the "feeler" type indicate that considerable rail tonnage is in prospect. One source inferred that approximately 30,000 tons of rail have been discussed with different roads over the

past two weeks and that this business may affect sales totals in the first half of March.

Plates

Railroad interest in new equipment is at low ebb and, were it not for a fair amount of tank building activity and occasional orders from other fabricators, plate rolling schedules would be far slimmer than even today's meager business permits.

CANADA

. . . *Railroad awards help business in provinces.*

TORONTO, Ont. — Railroad awards are stimulating business in the Canadian iron and steel industry and give assurance to the rolling stock producers of capacity operations for several months. Bookings by the Canadian National and Canadian Pacific railways involve expenditure of approximately $20,000,000 with further awards in prospect. So far, however, no rail contracts have been announced.

The latest award is by Canadian National Railways for 2000 steel-sheathed box cars for spring delivery, totaling around $7,000,000. Of this amount $2,400,000 each goes to National Steel Car Corp., Hamilton, Ont., and Eastern Car Co., Trenton, N. S., while Canadian Car & Foundry Co., Montreal, shares to the extent of $2,100,000. Canadian Car received an earlier order amounting to $1,150,000 from the Canadian National.

Spot buying by domestic consumers continues in good volume and producers also report the occasional contract. It is stated that steel mill operations continue at close to capacity mark, while Dominion Steel & Coal Corp., Sydney, N. S., for the year 1937 maintained an operating rate of 106 per cent. While pig iron production in January at 74,862 gross tons fell from 81,032 tons in the preceding month, steel ingot and castings production in January at 112,380 tons was up from 98,334 tons in December.

No change was reported in active blast furnaces, six blowing during the month.

Demand for merchant pig iron continues at the former high record of better than 2000 tons weekly. Melters are ordering as demands dictate and no additional forward delivery contracts were reported during the week. The daily melt continues around 70 per cent, with indications of early advance over this level. Foundry iron continues the most active on the list, with sales in excess of 1500 tons weekly. Malleable is picking up and malleable foundries are taking delivery in lots of 50 to 200 tons. Basic has limited call in the Montreal field while Ontario melters also are taking small lots at irregular intervals. Imports of pig iron are all from the United States and involve small tonnage lots of special grades. Prices are firm and unchanged.

New developments are slowing in the iron and steel scrap markets. Sales are below the average of last year and demand is specialized. Heavy melting steel has a ready market through the mills but dealers have little to offer. Other steel grades also show spotty activity. Machinery cast and stove plate are in demand and dealers state that there is no difficulty in disposing of all these materials they pick up. Shipments from rural districts are slow and dealers do not look for big movement of scrap on this account until the spring. Some dealers have advanced prices for scrap to stimulate offerings, but many scrap holders consider prices still too low and are not throwing accumulations on the market.

..SAN FRANCISCO..

. . . *Four furnaces idle since Christmas resume.*

SAN FRANCISCO, March 1.—Four Columbia Steel Co. open-hearth furnaces, which have been out since before Christmas, have resumed operations, according to Ambrose N. Diehl, president. Three of the furnaces are at Torrance, Cal., and the fourth is at Pittsburg, Cal.

Bids will be opened in the Pacific Northwest this week on the Big Eddy Columbia River bridge, near The Dalles, Ore., which will require 1000 tons of shapes, and the Lewiston, Idaho-Clarkston, Wash., Snake River bridge which will take 1020 tons of shapes and 700 tons of bars.

The Bureau of Reclamation asks bids March 16 for furnishing trash-rack metal work for 10 outlet-works trashrack structures, 18 main-unit-penstock trashrack structures and three station-service-penstock trash-rack structures at Grand Coulee Dam. Specifications are not yet available here, but probably more than 2000 tons will be required.

I. Magnin Co., an apparel firm, has announced that it will build a large Los Angeles store in the early spring, and steel men believe that considerable tonnage is involved.

A. L. Johnson Construction Co., Minneapolis, and C. Lytle Co., Sioux City, Iowa, are low bidders at $3,287,000 for constructing the Possum Kingdom dam on the Brazos River, Texas. More than 1000 tons shapes and plates will be required for the structure.

..CAST IRON PIPE..

Greensboro, N. C., will take bids soon for 12-in. pipe for main feeder line for water system in Walker Avenue, from Forest Avenue to Spring Garden Street. Cost about $34,000.

Houston, Tex., plans extensions in water pipe lines. Fund of $75,128 has been arranged through Federal aid. Work is scheduled to begin soon. J. Perry Moore is director of water department.

Wappingers Falls, N. Y., plans pipe lines for water system. Cost about $50,000. Special election has been called March 18 to approve project.

Manistique, Mich., plans extensions in water pipe lines, including connections of number of dead ends. Cost about $27,300. Financing is being arranged through Federal aid. P. H. Beauvais is city manager.

Melbourne, Iowa, plans pipe lines for extensions in water system. Cost about $25,000. Special election has been called on March 28 to approve bond issue in amount noted. Ralph W. Gearhart, 349 Twenty-first Street, S.E., Cedar Rapids, Iowa, is consulting engineer.

Lexington Water Co., Lexington, Ky., plans pipe line extensions and replacements in system; also other waterworks installation. Cost close to $200,000.

Lorain, Ohio, plans pipe lines for extensions and improvements in system, including new main line under Black River; also 1,500,000-gal. elevated steel tank and tower, new pumping machinery and other waterworks installation. Cost about $185,000. Financing will be arranged in part through Federal aid. Paul Mikus is service director; C. A. Pauly is chief engineer of water department.

Smithville, Ohio, plans extensions and improvements in water pipe lines; also other waterworks installation. Cost about $60,000. Financing has been arranged through Federal aid. Paul W. Elwell, 5005 Euclid Avenue, Cleveland, is consulting engineer.

Springhill, La., will take bids soon for extensions in pipe lines for water system; also for extensions and improvements in sewer system. Cost about $110,000. E. T. Archer & Co., New England Building, Kansas City, Mo., are consulting engineers.

Trempealeau, Wis., will take bids early in March for pipe lines for water system; also for pumping machinery and other waterworks installation. Cost about $40,000. Robert Cramer & Sons, 647 West Virginia Street, Milwaukee, are consulting engineers.

Milwaukee has placed 1675 tons of 6 to 16-in. Class C pipe and 101 tons specials with United States Pipe & Foundry Co., and 250 fire hydrants with M. & H. Valve & Fitting Co.

East Bay Municipal Utility District, Oakland, Cal., has announced that United States Pipe & Foundry Co., San Francisco office, is low bidder on 618 tons of 4, 6, 8 and 12-in. pipe, and American Cast Iron Pipe Co., San Francisco office, is low on 310 tons.

. . . CLEVELAND . . .

. . . Youngstown district mill schedules show slight gain.

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. . . District steel sellers see late 1938 more profitable.

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. . . Heavy melting steel scrap reported 50c a ton lower.

CLEVELAND, March 1.—Ingot output in the Valleys this week is up one point to 31 per cent, while operations in the Cleveland-Lorain district are unchanged at 25 per cent.

The slight improvement in aggregate incoming business, which was mentioned in the last report, has been approximated during the past week. The current volume is below the level which had been generally expected throughout the industry in earlier predictions. There is nothing to indicate a spurt in sales in the immediate future, but it is believed that a moderate gain will be made during March.

For 10 days in wire products small successive increases have been made in specifications received by mills. During the same period day-by-day sheet, strip and bar specifications have been irregular but have averaged a little higher in that period than in the preceding 10 days.

Although the entire industry confidently expects that the latter part of this year may be highly profitable, there is very little basis yet for any authoritative prediction as to what the average of steel works operations will be in 1938.

Considerable depends on how soon public confidence is restored and it is difficult to foresee when this will be accomplished.

The industry believes helpful steps toward starting the ball rolling would include Congressional alteration of the undistributed profits tax, the breaking of the used car jam and a favorable decision on the railroads request for higher freight rates.

Tool and die makers and parts makers of northern Ohio report that the automotive industry appears to be slightly ahead of schedule on its preparations for the next series of models. Over the immediate future little more than fill-in orders for steel are expected from the automotive industry.

Scrap is sentimentally weaker at Cleveland, No. 1 heavy melting steel quotations being reduced 50c. to $11.50 to $12 a ton.

Pig Iron

February pig iron shipments were just about equal to the January movement. The most heartening recent development has been a trend on the part of some consumers to make slightly heavier releases, covering their requirements for slightly longer periods than they were willing to chance prior to the price reaffirmations. Second quarter contracts are beginning to come out irregularly, but some fourth quarter contracts have not yet been exhausted and will be carried into second quarter since there has been no price change.

Bars, Plates and Shapes

Orders for hot-rolled bars remain light, with makers of road building machinery providing some stimulus in the absence of automotive and railroad equipment demand. The agricultural implement field continues as a possible potential source of fair tonnages, although the normal season for manufacturing in time for this year's sales is becoming shorter. It is possible a certain amount of farm demand not now foreseen may develop this year. Fabricated steel awards for the week in Ohio are light. Lundoff-Bicknell Co., Cleveland, has the general contract for hospital buildings at Warren, Pa., involving 961 tons of structural shapes and 100 tons of bars and mesh. Specifications for plates continue moderate.

Sheets and Strip

Demand for sheets remains without extensive change, although bookings during the past two weeks have been slightly improved over the volume received in the first two weeks of February. Producers report buying is diversified but that the lack of automotive specifications is keenly felt. Except for fill-in business from the Michigan plants, sheet sellers are not optimistic over the automotive outlook for the immediate future, since Detroit appears to be placing more emphasis on its preparation for 1939 models than on the balance of production on the current series. Strip sellers here have benefited recently from demand by makers of road building machinery. In both sheets and strip, current orders are accompanied by instructions for speedy deliveries.

Wire and Wire Products

Each day during the past week has shown small successive increases in total mill sales of wire. For the most part the gains have been due to the better movement of merchant products, accompanied by fairly steady demand from electrical appliance manufacturers. Producers are hopeful that increased volume will help to rectify the slight irregularities in secondary prices of merchant products which have occurred in a number of localities during the past few months. A survey of rod stocks in the hands of consumers shows that they are very low. Most wire drawers have failed to make replacement and have attempted in many cases to work down larger sizes of rods wherever possible. Export demand for practically all products is reported good.

. . . CINCINNATI. . .

. . . Four open hearths added lift rate to 40%.

CINCINNATI, March 1.—Mill bookings of sheets eased to less than 30 per cent of capacity the past week. Warehousemen are still active in the market, the leading district mill estimating business at about 50 per cent of normal from this source. Galvanized sheets also are an exception and demand for this type has been above that for other sheet mill products. Automotive ordering has declined sharply along with the miscellaneous demand. A cautious attitude is apparent on the part of consumers and with prices reaffirmed for second quarter at present levels, the incentive from this source is absent.

Buyers show no disposition to resist present price levels. Mill operations average about 25 per cent of capacity, a decrease from last week about equal to the dip in shipping demand. The leading district interest is a few points above this average.

Steel-making increased a few points the past week to just under 40 per cent when one interest, which began

the week with no open hearths on, started four. Present operations are about 40 per cent, with 14 out of 34 furnaces in use.

Dullness has a strong grip on the local pig iron market. New business is small and infrequent, while shipments on old contracts adhere to the slow rate established the latter part of January. Prices of both Northern and Southern iron have been reaffirmed for second quarter. The melt is unchanged at about 40 per cent.

..GREAT BRITAIN..

. . . Continental cartel to meet March 4; report an American agreement expected.

LONDON, March 1 (*By Cable*).—The Continental Steel Cartel meets in Brussels on March 4 when an announcement with reference to the American negotiations is expected. It is reported that an agreement has been reached to control exports.

Home demand for heavy steel is still strong but exports are quieter. Renewal of cartel after June 30 considered probable. The market in the meantime is quiet with prices tending to be lower and consumers are holding back. There are ample supplies of semi-finished steel as rerollers are quiet, sheet mills especially wanting orders.

The tin plate market is quiet except for some good buying in wasters by home consumers. Makers have agreed to restrict output of any one works to 60 per cent of agreed quota. United Kingdom output of tin plate and black plate last year was 957,700 tons.

Black sheets are quiet and galvanized sheets are dull. United Kingdom output of galvanized sheets last year was 345,900 tons.

New business in Cleveland foundry pig iron is virtually idle as large foreign supplies are still coming in, but the hematite market is brisker and some sales have been effected to Denmark. There is persistent talk that import duties will be reimposed but no official statement has yet been issued. Makers are overtaking delivery arrears.

Rolled steel output in the United Kingdom last year increased over one million tons to 9,569,900 tons.

....BUFFALO....

. . . Pig iron producers see inventories tapering.

BUFFALO, March 1.—From the greater number of pig iron buyers during February than in January, producers conclude that inventories are being exhausted at many plants. Small-sized business is fairly good and representative. Producers construe this as the beginning of a base for better business, though large users definitely are not in the market. Local producers have confirmed current prices for second quarter.

Steel commitments show very little change from the previous week with operations holding, and mills occupied running off miscellaneous collections of small orders.

The contract for the new dope room and zinc foundry for the Curtiss Aeroplane division of the Curtiss-Wright Corp., involving 300 tons of structural steel, has been rebid. Darin & Armstrong, Detroit, is low bidder on the general contract.

At Warren, Pa., Lundoff-Bicknell Co., Cleveland, is low bidder on a State hospital job, involving 1000 tons of structural steel. Another Pennsylvania job, bidding March 1, is a State sanitarium at Mt. Alto. This will require 1000 tons of structural steel.

Revision of figures on the New York State Cancer Hospital job in Buffalo, bidding March 31, shows that 500 tons of structural and 150 tons of bars will be used.

Bethlehem Charges Plot by Earle, CIO

BETHLEHEM STEEL CO., through Hoyt A. Moore, its chief counsel, charged this week that closing of its Cambria plant at Johnstown, Pa., last summer by Governor George H. Earle was part of a major conspiracy to force President Roosevelt to intervene on the side of the strikers.

The Committee for Industrial Organization, the governor and others in the anti-Bethlehem high command "planned" a telegram resulting in Pennsylvania militia closing the mills, Mr. Moore said at the National Labor Relations Board hearing at Johnstown.

..BIRMINGHAM..

. . . Steel, pig iron markets in South featureless.

BIRMINGHAM, March 1.—Pig iron prices have been reaffirmed for the second quarter. The base price remains at $20. There has been no change in this since March 4, 1937. Steel prices were reaffirmed two weeks ago. Market conditions are still sluggish, with bookings light. Weekly steel bookings have continued at about the same rate for some time. The announcement on pig iron prices has not yet affected buying to any noticeable extent. Foundries are still on a hand-to-mouth basis.

Ten and 11 open hearths were operated last week. Republic Steel Corp., which had been working four units for several weeks, dropped to three the middle of the week. Tennessee Coal, Iron & Railroad Co. worked four at Fairfield and three at Ensley. The schedule this week is 10, four being at Fairfield, three at Ensley and three at Gadsden.

There was a change in furnace operations, but without a loss as to number. Tennessee Coal, Iron & Railroad Co. blew out Ensley No. 6 on Feb. 23 and blew in Ensley No. 2 the same day. This furnace is on recarburizing iron, as was Ensley No. 6. The district's total of active stacks is still 13. Tennessee Coal, Iron & Railroad Co. has seven; Woodward Iron Co., three; Sloss-Sheffield Steel & Iron Co., two; Republic Steel Corp., one.

Hardaway Construction Co., Columbus, Ga., was low bidder last Friday for the construction of the substructure for the $1,600,000 bridge to be built by the Alabama Highway Department across the Tennessee river between Florence and Sheffield. Its bid was $218,436. Carey Reed Co., Lexington, Ky., and Birmingham, was low bidder for the construction of a steel and concrete underpass in Birmingham.

Electro-Metallurgical Co., a subsidiary of Union Carbide & Carbon Co., has announced indefinite postponement of a new plant at Muscle Shoals.

Russellville, Ala., will open bids March 15 for the construction of a municipal electrical distribution system.

. . . . NEW YORK. . . .

. . . Steel buying shows only slight gain.

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. . . $60,000,000 worth of public work held up by high labor rates.

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. . . Housing project to cost $10,000,000 approved.

NEW YORK, March 1.—Nearly all steel companies experienced a small gain in orders during the past week through their sales offices in this district. Some orders came through that had admittedly been held up pending settlement of wages and prices. There was also greater diversification in orders both as to products and customers. But at best, the gains were inconsequential in total tonnage. February bookings did not aggregate more than those of January, though both months were better than December.

This territory, depending to a large extent on railroad and building construction purchases, will probably experience no marked improvement until there is an expansion of buying in these fields. The official announcement by the Citizens Budget Commission of New York City that "unjustifiably high prevailing rates of wages set by the State Labor Department and the City Controller are holding up public contracts in excess of $60,000,000" is but one discouraging phase of the building situation. Opening of bids on a Queens-Midtown Tunnel contract, it was stated by the commission, has been indefinitely postponed because of the wage scales set by the State Labor Department, and similar delay is threatened on a second contract for the tunnel. Other large jobs on which there is a delay are a $3,000,000 Bronx sewer tunnel and a subway spur to the New York World's Fair site.

Details concerning the first large scale housing project in the Metropolitan area to be financed under the revised National Housing Act have been announced by N. K. Winston & Co., New York. The cost of the project, which is to be located in Queens on Flushing Bay near Astoria Avenue and Grand Central Parkway, will be about $10,000,000. It is planned to construct 400 houses that will provide housing facilities for 2500 families at rents ranging from $51 to $71 a month.

Pig Iron

February business showed no improvement over January, according to local sellers, and no change is anticipated until late March, at which time inventories are expected to reach a point that will necessitate substantial buying to replenish. Foundry activity in this district averages about three days a week with reduced heats and the trend of operations is still distinctly downward. Export inquiry is light and devoid of interest. A few small lots for shipment abroad were placed during the past week but the quantities covered were very small.

Reinforcing Bars

Approximately 1233 tons of bars are involved in the various jobs that have been reported as delayed due to the high hourly labor rates sponsored by the State Labor Department. New construction is slow in developing and outside of a World's Fair building, on which bids will be opened March 3, very little work is pending. Prices on engineered projects are showing little deviation from the published price, but quotations on a recent carlot inquiry for export were reported to be substantially under the 2.45c. base.

Plates and Sheets

Although still far from satisfactory, plate business is noticeably better even though the principal buying sources have yet to be heard from. One district office reported a February volume 75 per cent of a normal month's bookings, based on a comparatively large number of miscellaneous small orders averaging 10 tons apiece and with the largest order not over 40 tons. Steel for the six Milwaukee Road locomotives has been covered by the American Locomotive Co., amounting to about 250 tons, and the Alco Products division of that company has been awarded the contract by the New York City Department of Water Supply for 2670 tons of 60-in. welded steel pipe to be laid in Brooklyn.

Sheet business, after a momentary spurt following reaffirmation of prices, has settled back into the doldrums. The jobbing trade is still overstocked and manufacturing buyers are exhibiting little interest in the market. The price situation is definitely no longer a factor, and present buying is simply geared to production, which remains low.

. . . . ST. LOUIS. . . .

. . . Slight gain in steel buying is reported.

ST. LOUIS, March 1.—A slight improvement is noted in buying of finished steel as a result of the reaffirmation of prices for second quarter which apparently has restored confidence in the price situation. It is expected that there will be further ordering soon as consumers have been dissipating their inventories, which need replacement. Some specifications, which had been suspended because of the uncertainties which existed regarding prices, have been reinstated.

Missouri Rolling Mills Corp., St. Louis, has been awarded 190 tons of reinforcing bars for an addition to the bottling plant of Griesedieck Brothers Brewery Co. All bids have been rejected for the power house at the Missouri State prison at Jefferson City, requiring 100 tons of reinforcing bars, and new bids have been asked for March 29.

Releases of specifications against contracts for pig iron are being received by makers in better volume, but there still is no buying except of a carload or so for immediate shipment. Reaffirmation of prices for second quarter has had no effect on buying. A leading stove foundry in the Belleville sector expects to resume operations this week. Ingot operations are at 25.4 per cent of capacity.

. . PHILADELPHIA . .

. . . Eastern Pennsylvania rate off one point.

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. . . General uncertainty continues to discourage buying.

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. . . March bookings probably will top February's.

PHILADELPHIA, March 1.—Although two steel sellers say that their bookings are showing a slight but persistent up-trend, the remainder of the steel industry here is disappointed by the failure of consumer demand to throw off its inertia. This district particularly suffers from the listless support from shipbuilders and the railroads. The former have of course released some attractive tonnages, but deliveries are extended over several years, and the insistence of the Government that bids are too high on a mass of pending work is holding up a great deal of tonnage which otherwise would have been before steel makers by this time.

The carriers, on the other hand, are naturally withholding all purchases, even the most urgent of routine needs, until the ICC hands down some form of decision regarding the petition for a 15 per cent rate increase. No steel seller here expects that more than 10 per cent will be allowed, and to most sellers a much smaller increase would come as no great surprise. Assuming a 10 per cent advance, however, it seems that the carriers are on record to purchase a considerable volume of steel, but whether any real support from this direction can come before the middle of the year seems to be in doubt.

With only skeleton order books, most district mills are finding it difficult to maintain even a minimum amount of open hearth activity. The district, however, continues to operate on a par with the national average, the rate this week being 28 per cent of potential capacity, one point down from the preceding week.

Pig Iron

There is little buying of consequence, and no furnace representative looks for any change in this situation for some time to come. Some foundries are operating hardly at all, whereas other are finding it difficult to melt three days a week. Among consumers there seems to be some sentiment persisting that prices may fall off, despite second quarter reaffirmations by leading producers. Sellers scout this viewpoint, but nonetheless no buyer sees any advantage in purchasing on anything other than a hand-to-mouth basis.

Sheets, Plates and Shapes

Local autobody stamping plants continue to operate at a greatly reduced schedule, therefore they are in the market for very little steel. Jobbers are overstocked on most sheet grades, and releases into other outlets are very spotty and in unsubstantial volume. Plate turnover is almost nil, and the outlook is unpromising.

It was a comparatively active week in shapes, however, as much of the recently accumulated State work was released to mills. Bethlehem secured 815 tons for a Scranton hospital, and Belmont took three jobs, a 215-ton Auburn, N. Y., theatre, 190 tons for a Norristown hospital and 165 tons for a du Pont experimental station. Several thousand tons of State work is still pending, but when this tonnage is released over the next fortnight there will certainly be little activity in this area as private construction is nil. Reinforcing steel also is benefiting from the State awards, with Bethlehem taking about 360 tons during the week, and some smaller miscellaneous work going to other producers. Prices are steady but are at none too profitable a level.

Imports

The following iron and steel imports were received here during the past week: 150 tons of sponge iron, 45 tons of steel tubes, 33 tons of steel forgings and 26 tons of steel bars from Sweden.

. . . . PIPE LINES . . . .

Clareco Gas Co., Mount Pleasant, Mich., plans new welded steel pipe line from gas properties in Wise Township, Isabella County, Mich., to connection with main 4-in. welded pipe line of Gas Corp. of Michigan, Inc., Mount Pleasant, for natural gas transmission under contract with last noted company, to assist shortage in Mount Pleasant area.

Vermillion Natural Gas Co., Vermillion, S. D., plans steel pipe lines for natural gas distribution at Yankton, S. D., including welded steel main line for connection with company transmission line in that vicinity. Special election has been called March 8 by municipality to vote 20-year franchise for company. Cost about $100,000 with control station and other operating facilities.

United States Engineer Office, Philadelphia, closes bids March 4 for 22 lengths of 20¾-in. o.d. steel pontoon pipe, each length 40 ft. (Circular 291).

Twin Cities Gas Co., Sheffield, Ala., plans 4-in. submarine welded steel pipe line across Tennessee River, from Sheffield to Florence, Ala., for natural gas transmission.

Consumers Power Co., Jackson, Mich., and a group of independent natural gas operators in State have received a recommendation from State Public Utilities Commission, Lansing, Mich. Paul H. Todd, chairman, to arrange for joint construction of a welded steel pipe line from natural gas field districts to Battle Creek, Kalamazoo, Jackson, Flint and Ann Arbor, Mich., for natural gas distribution in these cities. Cost over $2,000,000 with booster stations, control plants and other operating facilities. Commission recommends further that necessary financing be arranged with RFC.

Quartermaster, Marine Corps, Parris Island, S. C., asks bids until March 8 for steel pipe and fittings; also for cast iron pipe and fittings, and brass pipe and fittings.

Greenwich Gas Co., Greenwich, Conn., plans pipe lines for extensions in gas transmission system in municipality and neighboring districts. Cost close to $400,000.

Standard Oil Co. of Ohio, Midland Building, Cleveland, has let contract to L. A. Wells Co., Schofield Building, for four 6-in. and one 8-in. steel pipe lines across Cuyahoga River in Cleveland area, for gasoline transmission.

Mexican Eagle Oil Co., Tampico, Mexico, plans new welded steel pipe line from Tampico oil field to Pozarica, about 20 miles, for crude oil transmission. Cost about 4,000,000 pesos (approximately $1,120,000) with booster pumping stations and operating facilities.

. . . BOSTON . . .

. . . Pig iron market unchanged on price announcement.

BOSTON, March 1.—The improvement in pig iron sales noted a week ago failed to continue, and the market enters the new month virtually at a standstill. Melters making inquiries for iron a week ago now say they do not need it, consequently have deferred placing orders. So far the reaffirming of prices for the second quarter has not been a market factor. The closing of the American Steel & Wire Co., Worcester, Mass., plant for three weeks has a depressing effect on the iron and steel industry in general. Representatives of other steel mills, steel fabricators and firms handling reinforcing steel all say there is nothing that indicates a business pickup within the near future.

FABRICATED STEEL

. . . Lettings decline to 6900 tons from 12,770 tons last week.

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. . . New projects lower at 8325 tons as against 13,865 tons a week ago.

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. . . Plate awards total 3960 tons.

NORTH ATLANTIC STATES

AWARDS

New York, 280 tons, school No. 89 in Bronx, to Bethlehem Fabricators, Inc., Bethlehem, Pa.

Queens, N. Y., 185 tons, school No. 32, to Bethlehem Fabricators, Inc., Bethlehem, Pa.

Westhampton Beach, N. Y., 260 tons, high school, to Weatherly Steel Co., Weatherly, Pa.

Auburn, N. Y., 225 tons, theater, to Belmont Iron Works, Philadelphia.

Auburn, N. Y., 170 tons, railroad bridge for Auburn Prison, to Phoenixville Bridge Co., Phoenixville, Pa.

Buffalo, 215 tons, factory building, Curtiss Aeorplane Co., to R. C. Mahon Co., Detroit.

Mansfield, Pa., 385 tons, State Teachers' College, to Rogers Structural Steel Co., Corry, Pa.

Norristown, Pa., 200 tons, addition to State Hospital, to Phoenix Bridge Co., Phoenixville, Pa.

East Stroudsburg, Pa., 285 tons, State Teachers' College, to Belmont Iron Works, Philadelphia.

Indiana, Pa., 500 tons, State Teachers' College, to Fort Pitt Bridge Works Co., Pittsburgh.

Scranton, Pa., 815 tons, hospital building, to Bethlehem Steel Co., Bethlehem, Pa.

Duquesne, Pa., 180 tons, bridge repairs, Pennsylvania Railroad, to Fort Pitt Bridge Works Co., Pittsburgh.

Newbridge, Del., 175 tons, fiber plant experiment station, to Belmont Iron Works, Philadelphia.

SOUTH AND SOUTHWEST

Radford, Va., 925 tons, power house and spillway bridge for American Gas & Electric Service Corp., to Virginia Bridge Co., Roanoke, Va.

Ponca City, Okla., 150 tons, bridge repairs, to J. B. Klein Iron & Foundry Co., Oklahoma City.

CENTRAL STATES

Lansing, Mich., 260 tons, coal trestle for Ottawa Street Power Station, to Jarvis Engineering Works, Lansing.

Cannelton, Ind., 150 tons, State bridge, to Central States Bridge & Structural Co., Indianapolis.

Delphi, Ind., 200 tons, Kokomo Pottery Co. building, to Hugh J. Baker Co., Indianapolis.

Fort Wayne, Ind., 430 tons, high school, to Joseph T. Ryerson & Son, Inc., Chicago.

Streator, Ill., 570 tons, transmission towers for Public Service Co. of Northern Illinois, to Aermotor Co., Chicago.

Mount Pulaski, Ill., 185 tons, bridge, to Missouri Bridge & Iron Co., East St. Louis, Ill.

Columbia, Ill., 140 tons, bridge, to Wendnagel & Co., Chicago.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Ashland-Bridgewater, N. H., 1000 tons, State bridge.

New York, 950 tons, alterations, Grand Central post office, O'Driscoll & Grove, Inc., New York, general contractors.

New York, 550 tons, lower East Side and Washington Heights health and teaching centers; Caulway, Inc., New York, low bidder.

New York, 200 tons, alterations to Lincoln Savings Bank Building.

Salem, N. J., 280 tons, H. J. Heinz Co. Building.

Warren, Pa., 1000 tons, State hospital buildings; Lundoff-Bicknell Co., Cleveland, general contractor.

Mount Alton, Pa., 1000 tons, State sanatorium; bids taken March 1.

THE SOUTH

Sylvania, Ga., 223 tons, building.

Centerville, Ala., 203 tons, draft tubes and gate tubes.

Houston, Tex., 300 tons, addition to office building.

CENTRAL STATES

Albion, Mich., 155 tons, foundry building, Bohn Aluminum Co.

Detroit, 500 tons, quenching stations and coal bins, Ford Motor Co., bids March 4.

State of Wisconsin, 500 tons, eight bridges; bids March 4.

Duluth, Minn., 600 tons, reservoir.

Clarksville, Mo., 2934 tons if welded, 3092 tons if riveted, dam No. 24; Central Engineering Co., Davenport, Iowa, general contractor.

WESTERN STATES

Walsenburg, Colo., 117 tons, overhead crossing; bids March 3.

Boulder City, Nev., 100 tons, bus structure for Metropolitan Water District switching station; American Bridge Co., Denver, low bidder.

Ely, Nev., 140 tons, overpass; bids March 10.

Grand Coulee Dam, Wash., about 2000 tons, trash rack structures; bids by Bureau of Reclamation, Denver, March 16.

The Dalles, Ore., 1000 tons, Big Eddy bridge over Columbia River; bids March 5.

Mare Island, Cal., 288 tons, caisson gate at Navy Yard; bids rejected and work will be done by Navy Yard labor.

FABRICATED PLATES

AWARDS

Brooklyn, 2670 tons, water mains in Avenue P and 65th Street, to Alco Products Co., New York.

Port Neches, Tex., 670 tons, 18 tanks for Texas Co., to Petroleum Iron Works, Houston, Tex.

Rutledge, Tex., 620 tons, penstocks for Lower Colorado River Authority, to Chicago Bridge & Iron Works, Chicago.

SHEET PILING

NEW PROJECTS

Blaisdell, Ariz., 126 tons, Gila project; this replaces Invitation 24-608-A which has been cancelled.

Riot at Wire Plant Between Rival Unions

CHICAGO.—A man was shot, another seriously wounded by a gas bomb, and several others slightly injured in a riot Feb. 28 at the plant of the Northwestern Barb Wire Co., Sterling, Ill., following the inability of the SWOC to obtain exclusive bargaining rights there.

At the expiration of the old CIO contract the management was presented with two requests for exclusive bargaining privileges, one from the SWOC and another from an AFL unit. Unable to grant either because of NLRB rules, the company was helpless.

A riot broke out between the two factions and finally was quelled by the county sheriff and a force of nearly 100 deputies. A Milwaukee district organizer for the SWOC was charged with inciting the riot and 35 others were jailed.

R. C. Mahon Co. Workers Vote Against CIO and AFL

DETROIT.—Fifty-seven per cent of the employees of the R. C. Mahon Co., Detroit structural steel fabricator, voted against representation of either CIO or AFL in an NLRB poll held last Friday, it has been announced by the Labor Board here. The CIO group got 161 votes, AFL 7, and 227 votes were cast against both organizations. The selection of a collective bargaining agency was the issue.

Industry Cheered by Reports Roosevelt May Seek a Truce

LEADERS in the metal working and other industries this week were studying with hope reports from Washington that President Roosevelt would propose no new economic or social legislation at this session of Congress.

In addition to a declaration by Bernard M. Baruch, New York financier, before the Senate Unemployment and Relief Committee that Government interference with business is preventing a business recovery, industry sees signs that the President, for political and other reasons, may order a truce on legislation that would further antagonize business.

Some Administration supporters at Washington, with an eye on the 1938 elections, are reported eager to vote for modification and perhaps repeal of the undistributed profits tax to reassure business men. And prospects for the President's wage-hour legislation at this session have been dimmed by the business recession which is forcing the Administration leaders to center their efforts on recovery.

Fear that the Administration will be blamed by the Republicans for the business decline during the campaign before the November Congressional elections is believed back of current efforts to repair the breach between Government and business.

Radio Station to Build Welded Steel Antenna Mast

A NEW type of steel antenna mast of all welded construction will be erected at Itasca, Ill., by Station WGN. The present Marconi type of antenna, consisting of a wire suspended vertically between two supporting towers, is being replaced by a modern, single, vertical radiator. Because the main mast members will be completely welded, the equipment will have the distinction of being the highest uniform cross section structure in the United States, according to the Truscon Steel Co., Youngstown, subsidiary of Republic Steel Corp., which will furnish the steel. It will be 750 ft. high.

The main mast will consist entirely of solid round and angle structural members, rolled by Republic and fabricated in the Truscon plant. Of interest is the fact that the average material thickness will be greater than that used in ordinary bridge construction, thus helping to reduce maintenance and increase service years.

Gray Iron Founders Will Meet March 25

GRAY iron foundry executives from all over the country will gather at Hotel Statler, Buffalo, on March 25 to attend a meeting of the Gray Iron Founders' Society, Inc.

Prominent speakers will address the meeting at the morning session, while the afternoon will be devoted to discussion of foundry problems and the election of directors. W. W. Rose, 1010 Public Square Building, Cleveland, is executive vice-president of the organization.

W. H. Davey Steel Co. and SWOC Confer on Wages

CLEVELAND.—Federal Conciliator J. F. Dewey reported, Feb. 26, that an oral agreement providing for resumption of work and further conferences on wage adjustments had been reached between the Steel Workers Organization Committee and the W. H. Davey Steel Co., Cleveland. The union alleged that the company had tried to cut wage rates 10 per cent, but company officials asserted the proposed adjustment called for reductions for only a few highly skilled workers on special operations.

Cold Rolled Spring Prices Reaffirmed

ATHENIA STEEL CO., Clifton, N. J., maker of cold rolled spring steel, has reaffirmed base prices on that product for the second quarter of 1938.

Irvin Works Turns Over First Cold Reduced Plate

PITTSBURGH.—The first cold reducing unit at Carnegie-Illinois Steel Corp.'s new Irvin works near Pittsburgh was turned over this week. Coils of hot rolled strip were shipped in from the Carnegie-Illinois McDonald Works at Youngstown for the trial rolling. The test run involved the making of cold reduced tin plate, which will be one of the chief products of the Irvin plant. Completion of the entire works, which will produce sheets, strip and tin plate is scheduled for July 1.

Tin Output in 1937 Reached a New High

WORLD production of tin in 1937 established a new high at 206,900 tons, a gain of 27,000 tons over the previous year's total, according to the International Tin Research and Development Council. Consumption in 1937 of 197,300 tons was also at a record level and showed an increase of 36,000 tons over the 1936 figure.

In the United States tin consumption last year was the highest on record at 86,663 tons, an increase of 19 per cent over the preceding year. Tin consumed by other large users was as follows: United Kingdom, 26,000 tons; Japan, 8200 tons; Russia, 25,000 tons, and Germany, 11,643 tons.

In 1937 new record outputs of tin plate were made in nearly all the important producing countries. About 65,000 tons of tin was used in tin plate manufacture in 1937 against 62,000 tons in 1936.

Plastics Products Are Exhibited By Bakelite

THE growth of the modern plastics industry and the role of plastics in modern living are entertainingly depicted at the Bakelite Travelcade, which was opened to the general public, March 1, at the Museum of Science and Industry, Rockefeller Center, New York. After a month at the New York museum, the Travelcade will tour New Jersey, and next June will be installed at the Franklin Institute, Philadelphia. It will also form part of the Bakelite Corp. exhibit at the New York World's Fair.

The uses of plastics are shown in a series of 22 or more booths covering various fields, such as automotive, aviation, transportation, radio, machinery and industrial equipment, abrasives, household and business appliances, building, home furnishing and others. In addition to hundreds of actual parts and the devices in which some of them are used, there are animated demonstrations that reveal some of the unusual properties of plastics materials.

. . .NON-FERROUS. . .

. . . *Copper buyers active here and abroad.*

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. . . *January tin deliveries drop 1130 tons.*

NEW YORK, March 1.—The slightly bullish tinge to Wall Street early in the week and the war scare that hovered over Europe stirred up considerable buying activity with the result that domestic sales of copper during the week touched the 10,000-ton mark, or more than had been sold in the preceding portion of the month. However, following the declines in the stock market over the week-end and the announcement of the weekly ingot rate, there has been a noticeable slackening in demand and the markets are again very quiet. Domestic copper quotations are firm and unchanged at 10c. per lb., Connecticut Valley, for electrolytic metal. European sales were also in good volume during the week and the foreign price rose as high as 10.40c. per lb., c.i.f., usual base ports, but dropped back to the 10c. level yesterday and today on diminished interest.

The Week's Prices. Cents Per Pound for Early Delivery

	Feb. 23	Feb. 24	Feb. 25	Feb. 26	Feb. 28	Mar. 1
Electrolytic copper, Conn.*	10.00	10.00	10.00	10.00	10.00	10.00
Lake copper, N. Y.	10.125	10.125	10.125	10.125	10.125	10.125
Straits tin, spot, New York	42.625	42.15	42.25	....	42.125	41.875
Zinc, East St. Louis	4.75	4.75	4.75	4.75	4.75	4.75
Zinc, New York	5.10	5.10	5.10	5.10	5.10	5.10
Lead, St. Louis	4.35	4.35	4.35	4.35	4.35	4.35
Lead, New York	4.50	4.50	4.50	4.50	4.50	4.50

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.
Aluminum, virgin, 99 per cent plus 20.00c.-21.00c. a lb., delivered.
Aluminum No. 12 remelt No. 2 standard, in carloads, 19.00c. to 19.50c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 15.75c. a lb., prompt, f.o.b. New York.
Antimony, American, 13.75c. per lb., prompt shipment, New York.
Quicksilver, $77.00 to $78.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 10.25c. a lb., less carload, delivered in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	43.50c. to 44.50c.
Tin, bar	45.50c. to 46.50c.
Copper, Lake	11.00c. to 12.00c.
Copper, electrolytic	11.00c. to 12.00c.
Copper, castings	10.50c. to 10.75c.
*Copper sheets, hot-rolled	18.125c.
*High brass sheets	16.625c.
*Seamless brass tubes	19.375c.
*Seamless copper tubes	18.625c.
*Brass rods	12.625c.
Zinc, slabs	6.25c. to 7.25c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	11.00c.
Lead, American pig	5.50c. to 6.50c.
Lead, bar	6.625c. to 7.625c.
Lead, sheets, cut	8.00c.
Antimony, Asiatic	16.00c. to 17.00c.
Alum., virgin, 99 per cent plus	22.50c. to 24.00c.
Alum., No. 1 for remelting, 98 to 99 per cent	19.50c. to 21.00c.
Solder, ½ and ½	29.00c. to 31.00c.
Babbitt metal, commercial grade	20.00c. to 50.00c.

*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 25 per cent allowed off for extras, except copper sheets and brass rods, on which allowance is 40 per cent.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	46.25c.
Tin, bar	48.25c.
Copper, Lake	11.00c. to 11.25c.
Copper, electrolytic	11.00c. to 11.25c.
Copper, castings	10.75c.
Zinc, slabs	7.25c. to 7.50c.
Lead, American pig	5.00c. to 5.25c.
Lead, bar	8.25c.
Antimony, Asiatic	18.50c.
Babbitt metal, medium grade	19.50c.
Babbitt metal, high grade	48.75c.
Solder, ½ and ½	26.75c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.75c.	8.50c.
Copper, hvy. and wire	7.00c.	7.50c.
Copper, light and bottoms	6.25c.	6.50c.
Brass, heavy	4.375c.	5.00c.
Brass, light	3.625c.	4.375c.
Hvy. machine composition	6.75c.	7.25c.
No. 1 yel. brass turnings	4.375c.	4.875c.
No. 1 red brass or compos. turnings	6.375c.	6.875c.
Lead, heavy	3.75c.	4.125c.
Cast aluminum	9.875c.	11.00c.
Sheet aluminum	11.50c.	13.00c.
Zinc	2.50c.	3.75c.

Zinc

Consumers have been relatively inactive when compared with other nonferrous users, but the week's sales of prime Western of 2169 tons were 350 tons above the previous week. Shipments for the week were 2803 tons, down slightly from the previous figure, and undelivered stocks decreased to 36,408 tons. Domestic quotations are unchanged at 5.10c. per lb., New York, while the London price declined from 3.28c., the price of a week ago, to 3.19c., this morning's price.

Lead

The volume of sales during the past week was the best since early January and in many cases sellers exceeded their sales quotas. The bulk of the week's sales was for March delivery and to date about 60 per cent of that month's requirements has been covered. April books, which were opened today, have been barely touched. Domestic quotations are firm at 4.50c. a lb., New York. Statistics for January showed that smelters had taken steps to bring production in line with consumption to avoid unwieldy stocks. The output in January was 39,196 tons, or 10,385 tons below the December figure. Shipments in January were still below the production figure and stocks increased. At the end of the month reserves totaled 133,401 tons, as compared with 129,131 tons at the conclusion of the previous month. January shipments were 34,923 tons, or 903 tons above the December total.

Tin

Buying continues at the same dull levels of the past month. The Navy purchase of 90 tons was probably the largest lot bought during the week. At the present rate of operation tin plate makers still have substantial stocks and are not expected to be interested in buying for some time to come. Prices moved in limited range but were slightly above the preceding week's level. The average Straits price for the five-day period ended today is 42.21c., as against 41.875c. per lb., is identical to the price pervailing a week ago. Prompt metal in London this morning was priced at £185 15s., up 10s. from the price of a week ago. Tin deliveries in February declined 1130 tons to 4420 tons, the smallest shipments of any month since November, 1935.

IRON AND STEEL SCRAP

. . . Prices softer at Pittsburgh, Cleveland and Detroit.

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. . . Composite declines 9c to $13.58.

MARCH 1.—Based on a small tonnage sale of No. 1 steel into consumption at Pittsburgh at $13.75 and broker buying prices, the scrap market there is off 25c. on the principal grades, bringing the average on No. 1 steel $1 under the Philadelphia price level, which is unchanged. Slight increases in ingot output in the Chicago district has tended to produce a better feeling there and has left prices unchanged, except on blast furnace grades, which are exhibiting weakness all over the country. THE IRON AGE composite price has declined 9c. to $13.58, the same figure as prevailed on Dec. 21, and down 42c. from the $14 average that prevailed during January. The Cleveland market is sentimentally weaker and the entire list has been moved down 50c.

Export buying prices have weakened at Boston and New York, as purchases of material for the last European Scrap Cartel order reach the clean-up stage. New independent buying on the part of the Italians is reported, however, but at a price said to be $1.50 below the last cartel purchase price. The Japanese continue to buy in limited tonnages.

Pittsburgh

The market tone shows slightly less strength than a week ago, but No. 1 heavy melting is still coming out in small lots only. Odd carloads are being bought by brokers for $13.50, while other transactions have been made recently at $13.75 and $14. However, a small tonnage of No. 2 steel was sold into consumption during the past week at $13.75. Considering these conditions No. 1 heavy melting is off 25c. a ton from last week's price, now being quoted at $13.50 to $14 a ton. Despite the almost complete absence of consumer buying, dealers show no willingness to let accumulations go at figures less than those now being quoted.

Chicago

A better feeling is evident among the trade here, as slight operating increases have been announced by some district mills. Scrap shipping schedules have not yet benefited noticeably, but higher operations are being predicted for March and a fair degree of optimism is being expressed. Prices generally are steady this week, no mill activity having been reported since last week's small sale at $12. Dealers are offering about $12 for heavy melting steel currently, but the Rock Island Railroad withdrew its list last week with more than $12.50 gross delivered said to have been bid. The Burlington list is understood to have brought bids between $12.75 and $13 per gross ton delivered.

Philadelphia

The failure of steel-making operations to show much life continues to depress sentiment here, although the support of continued export buying is serving to offset any tendency for drastic price weakness. No. 2 steel is particularly plentiful at the moment, and distress lots have forced quotations off 50c. On the other hand, No. 1 steel is retained at $14.50 to $15 on the strength of continued buying for export and, also, spotty purchases for delivery into two domestic mills. At least one broker is willing to pay $13 for stove plate and $14.50 for heavy breakable cast, both delivered to an eastern Pennsylvania user. The remainder of the list, however, is inactive and untested, with quoted price levels thereby being very nominal. The Budd company's March list of 2200 tons of compressed bundles was bid in yesterday by a broker, the price being slightly under that ruling a month earlier.

Cleveland

The market is sentimentally weaker in the Cleveland district, all quotations being marked down this week 50c. per ton. For the most part, the easier tone here is the reflection of weaknesses in other districts recently, which has resulted in slightly lower buying prices by local dealers. Mills remain out of the market. No. 1 heavy melting steel is now $11.50 to $12 at Cleveland. In the Youngstown district, machine shop turnings have been marked down to $9 to $9.50 per ton with No. 1 heavy melting steel remaining unchanged there at last week's level of $13 to $13.50.

Buffalo

The only activity in this district is the continued policy of the chief consumer of accepting further shipments of scrap under a price averaging arrangement. This policy has relieved possibility of financial stress on the part of some dealers, where commitments had been made and where material held overly long in yards, is subject to depreciation.

St. Louis

The scrap iron market is extremely dull. Mills in the district are not buying and give no indication as to when they will come into the market again for sizable tonnages. As a result, prices, which are unchanged, are nominal.

Cincinnati

The old materials market remains dull. Small activity in sheet clippings and blast furnace scrap provided small surcease from inertia the past week, but failed to give tone to the market. Prices are unchanged and dealers mark time awaiting business change.

Detroit

Speculative buyers withdrew support from the Detroit market late last week, causing a sharp drop in prices in heavy melting steel, and borings and turnings. As prices became known, successive bids received by automotive producers showed increasing weakness. This was a retreat from a price position held firmly in the Detroit market for 10 weeks. Of all the items, turnings and borings represent the weakest spot. Chevrolet sold turnings and borings for slightly over $5. Chrysler found a similar weakness. Strength was retained, however, in foundry scrap. New model programs probably will add considerable strength in cast iron items as automobile programs for 1939 will be heavy. Demand from upstate has pushed the price of stove plate slightly upward.

New York

Two of the brokers handling exports have reduced their buying prices $1 a ton on Nos. 1 and 2 heavy melting steel, but another one of the principal factors is holding to previous levels of $13.50 and $12 respectively. For several weeks, lower prices have been offered at upstate points, and the present move has been anticipated in view of the absence of new orders from abroad. The last big European Scrap Cartel purchase of 500,000 tons is now in the cleanup stage, and no new business is expected much before June or later. A substantial tonnage of heavy melting steel has been recently bought by Italian interests, however, outside the cartel setup. This material, which is to be shipped from Southern and Gulf ports, is reported to have brought approximately $1.50 a ton less than the previous cartel order. The Japanese continue to buy in lots of a few thousand tons.

Boston

Brokers report it is impossible to sell steel turnings, blast furnace material and bundled skeleton to Pennsylvania consumers, and that no domestic demand exists for other types of scrap. Shipments on old orders to the American Steel & Wire Co., Worcester, Mass., have been held up for three weeks at least. Export scrap continues to be moved, but new orders are nil, and indications are the market will come to a standstill as soon as current loadings are concluded. Prices for export material are easier.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$13.50 to $14.00
Railroad hvy. mltng.	15.00 to 15.50
No. 2 hvy. mltng. steel	12.50 to 13.00
Scrap rails	15.00 to 15.50
Rails 3 ft. and under	17.75 to 18.25
Comp. sheet steel	13.50 to 14.00
Hand bundled sheets	12.50 to 13.00
Hvy. steel axle turn.	11.50 to 12.00
Machine shop turn.	7.50 to 8.00
Short shov. turn.	7.50 to 8.00
Mixed bor. & turn.	6.00 to 6.50
Cast iron borings	6.00 to 6.50
Cast iron carwheels	15.00 to 15.50
Hvy. breakable cast	12.50 to 13.00
No. 1 cupola cast	15.50 to 16.00
RR. knuckles & cplrs.	17.50 to 18.00
Rail coil & leaf springs	17.50 to 18.00
Rolled steel wheels	17.50 to 18.00
Low phos. billet crops	18.00 to 18.50
Low phos. sh. bar	17.50 to 18.00
Low phos. punchings	17.00 to 17.50
Low phos. plate, hvy.	17.00 to 17.50
Low phos. plate clips	15.00 to 15.50
Steel car axles	17.50 to 18.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$14.50 to $15.00
No. 2 hvy. mltng. steel	12.50 to 13.00
Hydraulic bund., new	14.50 to 15.00
Hydraulic bund., old	10.00 to 10.50
Steel rails for rolling	16.00 to 16.50
Cast iron carwheels	15.50 to 16.00
Hvy. breakable cast	14.50 to 15.00
No. 1 cast	15.50 to 16.00
Stove plate (steel wks.)	13.00 to 13.50
Railroad malleable	15.00 to 15.50
Machine shop turn.	6.50 to 7.00
No. 1 blast furnace	6.00 to 6.50
Cast borings	6.00 to 6.50
Heavy axle turnings	10.50 to 11.00
No. 1 low phos. hvy.	17.00 to 17.50
Couplers & knuckles	17.00 to 17.50
Rolled steel wheels	17.00 to 17.50
Steel axles	19.00 to 19.50
Shafting	19.00 to 19.50
No. 1 RR. wrought	15.00 to 15.50
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire	11.00 to 11.50
Cast borings (chem.)	12.50 to 13.00

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton
Hvy. mltng. steel	$12.00 to $12.50
Auto. hvy. mltng. steel alloy free	10.50 to 11.00
No. 2 auto. steel	10.00 to 10.50
Shoveling steel	12.00 to 12.50
Hydraul. comp. sheets	11.00 to 11.50
Drop forge flashings	9.75 to 10.25
No. 1 busheling	10.75 to 11.25
No. 2 busheling, old	5.25 to 5.75
Rolled carwheels	14.50 to 15.00
Railroad tires, cut	16.00 to 17.00
Railroad leaf springs	15.50 to 16.00
Steel coup. & knuckles	14.50 to 15.00
Axle turnings	11.50 to 12.00
Coil springs	16.50 to 17.00
Axle turn. (elec.)	11.50 to 12.00
Low phos. punchings	15.50 to 16.00
Low phos. plates, 12 in. and under	14.50 to 15.00
Cast iron borings	5.50 to 6.00
Short shov. turnings	7.25 to 7.75
Machine shop turn.	5.00 to 5.50
Rerolling rails	15.25 to 15.75
Steel rails under 3 ft.	15.50 to 16.00
Steel rails under 2 ft.	16.00 to 16.50
Angle bars, steel	14.00 to 14.50
Cast iron carwheels	13.75 to 14.25
Railroad malleable	13.25 to 13.75
Agric. malleable	12.00 to 12.50
	Per Net Ton
Iron car axles	$18.00 to $18.50
Steel car axles	16.50 to 17.00
No. 1 RR. wrought	9.50 to 10.00
No. 2 RR. wrought	10.75 to 11.25
Locomotive tires	15.75 to 16.25
Pipes and flues	9.25 to 9.75
No. 1 machinery cast	11.50 to 12.00
Clean auto. cast	11.25 to 11.75
No. 1 railroad cast	10.75 to 11.25
No. 1 agric. cast	10.50 to 11.00
Stove plate	8.50 to 9.00
Grate bars	8.50 to 9.00
Brake shoes	8.00 to 8.50

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$13.00 to $13.50
Hydraulic bundles	12.50 to 13.00
Machine shop turn.	9.00 to 9.50

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$11.50 to $12.00
No. 2 hvy. mltng. steel	10.50 to 11.00
Comp. sheet steel	11.00 to 11.50
Light bund. stampings	8.00 to 8.50
Drop forge flashings	10.50 to 11.00
Machine shop turn.	7.00 to 7.50
Short shov. turn.	8.00 to 8.50
No. 1 busheling	10.50 to 11.00
Steel axle turnings	9.50 to 10.00
Low phos. billet and bloom crops	17.50 to 18.00
Cast iron borings	7.50 to 8.00
Mixed bor. & turn.	7.50 to 8.00
No. 2 busheling	7.50 to 8.00
No. 1 cast	15.50 to 16.00
Railroad grate bars	7.50 to 8.00
Stove plate	7.50 to 8.00
Rails under 3 ft.	17.00 to 17.50
Rails for rolling	15.50 to 16.00
Railroad malleable	15.50 to 16.00
Cast iron carwheels	14.50 to 15.00

BUFFALO

Per gross ton, f.o.b. consumers' plants:

No. 1 hvy. mltng. steel	$12.50 to $13.00
No. 2 hvy. mltng. steel	10.50 to 11.00
Scrap rails	12.50 to 13.00
New hvy. b'ndled sheets	11.00 to 11.50
Old hydraul. bundles	10.00 to 11.00
Drop forge flashings	10.50 to 11.00
No. 1 busheling	10.50 to 11.00
Hvy. axle turnings	11.00 to 11.50
Machine shop turn.	6.50 to 7.00
Knuckles & couplers	16.00 to 16.50
Coil & leaf springs	16.00 to 16.50
Rolled steel wheels	16.00 to 16.50
Low phos. billet crops	17.00 to 17.50
Shov. turnings	8.00 to 8.50
Mixed bor. & turn.	7.00 to 7.50
Cast iron borings	7.00 to 7.50
Steel car axles	16.00 to 16.50
No. 1 machinery cast	15.00 to 15.50
No. 1 cupola cast	13.50 to 14.00
Stove plate	11.50 to 12.00
Steel rails under 3 ft.	17.50 to 18.00
Cast iron carwheels	14.50 to 15.00
Railroad malleable	14.50 to 15.00
Chemical borings	10.00 to 10.50

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting	$12.00 to $12.50
No. 1 hvy. melting	12.00 to 12.50
No. 2 hvy. melting	11.00 to 11.50
No. 1 locomotive tires	16.00 to 16.50
Misc. stand. sec. rails	13.00 to 13.50
Railroad springs	15.50 to 16.00
Bundled sheets	10.00 to 10.50
No. 1 busheling	7.00 to 7.50
Cast bor. & turn.	5.50 to 6.00
Rails for rolling	14.00 to 14.50
Machine shop turn.	5.00 to 5.50
Heavy turnings	8.50 to 9.00
Steel car axles	19.50 to 20.00
Iron car axles	21.50 to 22.00
No. 1 RR. wrought	8.00 to 8.50
No. 2 RR. wrought	12.00 to 12.50
Steel rails under 3 ft.	14.50 to 15.00
Steel angle bars	13.50 to 14.00
Cast iron carwheels	13.50 to 14.00
No. 1 machinery cast	12.00 to 12.50
Railroad malleable	13.00 to 13.50
No. 1 railroad cast	11.50 to 12.00
Stove plate	9.00 to 9.50
Agricul. malleable	10.00 to 10.50
Grate bars	9.50 to 10.00
Brake shoes	9.00 to 9.50

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel	$9.50 to $10.00
No. 2 hvy. mltng. steel	7.50 to 8.00
Scrap rails for mltng.	14.50 to 15.00
Loose sheet clippings	5.50 to 6.00
Hydrau. b'ndled sheets	9.00 to 9.50
Cast iron borings	3.00 to 3.50
Machine shop turn.	3.50 to 4.00
No. 1 busheling	8.00 to 8.50
No. 2 busheling	3.00 to 3.50
Rails for rolling	16.50 to 17.00
No. 1 locomotive tires	13.00 to 13.50
Short rails	17.00 to 17.50
Cast iron carwheels	11.50 to 12.00
No. 1 machinery cast	11.00 to 11.50
No. 1 railroad cast	9.00 to 9.50
Burnt cast	5.50 to 6.00
Stove plate	5.50 to 6.00
Agricul. malleable	10.50 to 11.00
Railroad malleable	12.50 to 13.00
Mixed hvy. cast	7.50 to 8.00

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel	$11.50 to $12.00
Scrap steel rails	14.00 to 14.50
Short shov. turnings	7.50 to 8.10
Stove plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR. wrought	10.00
Rails for rolling	15.00 to 16.00
No. 1 cast	14.00 to 16.50
Tramcar wheels	14.00 to 15.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel	$8.50 to $9.00
No. 2 hvy. mltng. steel	7.50 to 8.00
Borings and turnings	5.00 to 5.50
Long turnings	4.50 to 5.00
Short shov. turnings	5.50 to 6.00
No. 1 machinery cast	11.75 to 12.25
Automotive cast	12.75 to 13.25
Hvy. breakable cast	10.25 to 10.75
Hydraul. comp. sheets	10.00 to 10.50
Stove plate	8.00 to 8.50
New factory bushel	9.00 to 9.50
Old No. 2 busheling	5.00 to 5.50
No. 2 busheling (black fender stock)	Nominal
Sheet clippings	7.25 to 7.75
Flashings	8.50 to 9.00
Low phos. plate scrap	9.75 to 10.25

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel	$11.00 to $11.50
No. 2 hvy. mltng. steel	9.50 to 10.00
Hvy. breakable cast	10.50 to 11.00
No. 1 machinery cast	11.50 to 12.00
No. 2 cast	9.50 to 10.00
Stove plate	9.00 to 9.50
Steel car axles	20.00 to 20.50
Shafting	16.00 to 16.50
No. 1 RR. wrought	11.50 to 12.00
No. 1 wrought long	10.00 to 10.50
Spec. iron & steel pipe	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Clean steel turnings*	5.00 to 5.50
Cast borings*	5.00 to 5.50
No. 1 blast furnace	5.00 to 5.50
Cast borings (chem.)	9.50 to 10.00
Unprepared yard scrap	7.50 to 8.00
Light iron	4.00 to 4.50
Per gross ton, delivered local foundries:	
No. 1 machn. cast	$15.50 to $16.00
No. 2 cast	13.00 to 13.50

*$1.50 less for truck loads.

BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel	$13.30 to $13.80
Scrap rails	13.30 to 13.80
No. 2 steel	12.30 to 12.80
Breakable cast	9.75
Machine shop turn.	2.60
Mixed bor. & turn.	2.60
Bun. skeleton long	6.50 to 6.75
Shafting	17.00 to 17.50
Cast bor. chemical	6.00 to 6.50
Per gross ton delivered consumers' yards:	
Textile cast	15.00 to 15.50
No. 1 machine cast	15.00 to 15.50

PACIFIC COAST

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$11.65 to $12.15
No. 2 hvy. mltng. steel	10.65 to 11.15

CANADA

Dealers' buying prices at their yards, per gross ton:

	Toronto	Montreal
No. 1 hvy. mltng. steel	$10.50	$9.50
No. 2 hvy. mltng. steel	9.50	8.50
Mixed dealers steel	8.50	7.50
Scrap pipe	8.50	7.50
Steel turnings	7.50	7.00
Cast borings	8.50	7.50
Machinery cast	15.00	14.00
Dealers cast	13.00	12.00
Stove plate	11.00	10.50

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges	
No. 1 hvy. mltng. steel	$12.50 to $13.50
No. 2 hvy. mltng. steel	11.00 to 12.00
No. 2 cast	11.00
Stove plate	8.50 to 9.00
Boston on cars at Army Base or Mystic Wharf	
No. 1 hvy. mltng. steel	$13.50 to $14.00
No. 2 hvy. mltng. steel	12.50 to 13.00
Rails (scrap)	13.50 to 14.00
Philadelphia, delivered alongside boats, Port Richmond	
No. 1 hvy. mltng. steel	$14.00 to $14.50
No. 2 hvy. mltng. steel	13.00 to 13.50

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are $2 a ton higher, and delivered Detroit $3 higher.

	Per Gross Ton
Rerolling	$37.00
Forging quality	43.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or Bessemer	$37.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	2.10c.

Wire Rods
(No. 5 to 9/32 in.)

	Per Gross Ton
F.o.b. Pittsburgh or Cleveland	$47.00
F.o.b. Chicago, Youngstown or Anderson, Ind.	48.00
F.o.b. Worcester, Mass.	49.00
F.o.b. Birmingham	50.00
F.o.b. San Francisco	56.00
F.o.b. Galveston	53.00

Rods over 9/32 in. or 47/64 in., inclusive, $5 a ton over base.

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh	2.45c.
F.o.b. Chicago or Gary	2.50c.
F.o.b. Duluth	2.60c.
Del'd Detroit	2.60c.
F.o.b. Cleveland	2.50c.
F.o.b. Buffalo	2.55c.
Del'd Philadelphia	2.75c.
Del'd New York	2.79c.
F.o.b. Birmingham	2.60c.
F.o.b. cars dock Gulf ports	2.85c.
F.o.b. cars Pacific ports	3.00c.

Rail Steel
(For merchant trade)

F.o.b. Pittsburgh	2.30c.
F.o.b. Cleveland, Chicago, Gary or Moline, Ill.	2.35c.
F.o.b. Buffalo	2.40c.
F.o.b. Birmingham	2.45c.
F.o.b. cars dock Gulf ports	2.70c.
F.o.b. cars dock Pacific ports	2.85c.

Billet Steel Reinforcing
(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	2.45c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.50c
Del'd Detroit	2.60c.
F.o.b. cars dock Gulf ports	2.85c.
F.o.b. cars dock Pacific ports	2.95c.

Rail Steel Reinforcing
(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	2.30c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.35c.
F.o.b. cars dock Gulf ports	2.70c.
F.o.b. cars dock Pacific ports	2.80c.

Iron

F.o.b. Chicago	2.40c.
F.o.b. Pittsburgh (refined)	3.60c.

Cold Finished Bars and Shafting*

	Base per Lb.
F.o.b. Pittsburgh	2.90c.
F.o.b. Cleveland, Chicago and Gary	2.95c.
F.o.b. Buffalo	3.00c.
F.o.b. Detroit	2.95c.

* In quantities of 10,000 to 19,999 lb.

Plates

	Base per Lb.
F.o.b. Pittsburgh	2.25c.
F.o.b. Chicago or Gary	2.30c.
Del'd Cleveland	2.445c.
F.o.b. Coatesville or Spar. Pt.	2.35c.
Del'd Philadelphia	2.44c.
Del'd New York	2.54c.
F.o.b. Birmingham	2.40c.
F.o.b. cars dock Gulf ports	2.65c.
F.o.b. cars dock Pacific ports	2.80c.
Wrought iron plates, f.o.b. Pittsburgh	3.80c.

Floor Plates

F.o.b. Pittsburgh	3.50c.
F.o.b. Chicago	3.55c.
F.o.b. Coatesville	3.60c.
F.o.b. cars dock Gulf ports	3.90c.
F.o.b. cars dock Pacific ports	4.05c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh	2.25c.
F.o.b. Chicago	2.30c.
Del'd Cleveland	2.445c.
F.o.b. Buffalo or Bethlehem	2.35c.
Del'd Philadelphia	2.465c.
Del'd New York	2.5125c.
F.o.b. Birmingham (standard)	2.40c.
F.o.b. cars dock Gulf ports	2.60c.
F.o.b. cars dock Pacific ports	2.80c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.60c.
F.o.b. Chicago or Buffalo	2.70c.
F.o.b. cars dock Gulf or Pacific Coast ports	3.05c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$42.50
Angle bars, per 100 lb	2.80

F.o.b. Basing Points

Light rails (from billets) per gross ton	$43.00
Light rails (from rail steel) per gross ton	42.00

	Base per Lb.
Spikes	3.15c.
Tie plates, steel	2.30c.
Tie plates, Pacific Coast ports	2.40c.
Track bolts, to steam railroads	4.35c.
Track bolts, to jobbers, all sizes (per 100 counts)	65-5 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	2.40c.
No. 10, f.o.b. Gary	2.50c.
No. 10, del'd Detroit	2.60c.
No. 10, del'd Philadelphia	2.70c.
No. 10, f.o.b. Granite City	2.60c.
No. 10, f.o.b. Birmingham	2.55c.
No. 10, f.o.b. cars dock Pacific ports	2.95c.
No. 10, wrought iron, P'gh	4.25c.

Hot Rolled Annealed

No. 24, f.o.b. Pittsburgh	3.15c.
No. 24, f.o.b. Gary	3.25c.
No. 24, del'd Detroit	3.35c.
No. 24, del'd Philadelphia	3.45c.
No. 24, f.o.b. Granite City	3.35c.
No. 24, f.o.b. Birmingham	3.30c.
No. 24, f.o.b. cars dock Pacific ports	3.80c.
No. 24, wrought iron, Pittsburgh	5.15c.

*Heavy Cold Rolled**

No. 10 gage, f.o.b. Pittsburgh	3.00c.
No. 10 gage, f.o.b. Gary	3.10c.
No. 10 gage, f.o.b. Detroit	3.20c.
No. 10 gage, del'd Philadelphia	3.30c.
No. 10, f.o.b. Granite City	3.20c.
No. 10 gage, f.o.b. Birmingham	3.15c.
No. 10 gage, f.o.b. cars, dock Pacific ports	3.60c.

*Light Cold Rolled**

No. 20 gage, f.o.b. Pittsburgh	3.45c.
No. 20 gage, f.o.b. Gary	3.55c.
No. 20 gage, del'd Detroit	3.65c.
No. 20 gage, del'd Philadelphia	3.75c.
No. 20 f.o.b. Granite City	3.65c.
No. 20 gage, f.o.b. Birmingham	3.60c.
No. 20 gage, f.o.b. cars, dock Pacific ports	4.00c.

* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	3.80c.
No. 24, f.o.b. Gary	3.90c.
No. 24, del'd Philadelphia	4.10c.
No. 24, f.o.b. Granite City	4.00c.
No. 24, f.o.b. Birmingham	3.95c.
No. 24, f.o.b. cars, dock, Pacific ports	4.40c.
No. 24, wrought iron, Pittsburgh	6.10c.

Electrical Sheets
(*F.o.b. Pittsburgh*)

	Base per Lb.
Field grade	3.35c.
Armature	3.70c.
Electrical	4.20c.
Special Motor	5.10c.
Special Dynamo	5.80c.
Transformer	6.30c.
Transformer Special	7.30c.
Transformer Extra Special	7.80c.

Base gage changed from 28 to 24 gage. Gage extras are the same as those applying on hot-rolled annealed sheets with few exceptions.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extras plus 25c. per 100 lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	4.10c.
F.o.b. Gary	4.20c.
F.o.b. cars dock, Pacific ports	4.80c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	3.50c.
No. 20, f.o.b. Gary	3.60c.
No. 20, f.o.b. Granite City	3.70c.
No. 20, f.o.b. cars dock Pacific ports	4.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh, per lb.	3.30c.
No. 28, Gary	3.40c.
No. 28, f.o.b. Granite City	3.50c.
No. 28, cars dock Pacific ports, boxed	4.175c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. Pittsburgh district mill	$5.35
Standard cokes, f.o.b. Gary	5.45
Standard coke, f.o.b. Granite City	5.55

Special Coated Manufacturing Ternes

	Base per Box
F.o.b. Pittsburgh	$4.65
F.o.b. Gary	4.75
F.o.b. Granite City	4.85

Roofing Terne Plate
(*F.o.b. Pittsburgh*)
(Per Package, 112 sheets, 20 x 28 in.)

8-lb. coating I.C.	$12.00
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.00
25-lb. coating I.C.	16.00
30-lb. coating I.C.	17.25
40-lb. coating I.C.	19.50

Hot-rolled Hoops, Bands, Strip and Flats under ¼ In.

	Base per Lb.
All widths up to 24 in., Pittsburgh	2.40c.
All widths up to 24 in., Chicago	2.50c.
All widths up to 24 in., del'd Detroit	2.60c.
All widths up to 24 in., Granite City	2.60c.
All widths up to 24 in., Birmingham	2.55c.
Cooperage stock, Pittsburgh	2.50c.
Cooperage stock, Chicago	2.60c.

Cold Rolled Strip*

	Base per Lb.
F.o.b. Pittsburgh	3.20c.
F.o.b. Cleveland	3.20c.
Del'd Chicago	3.49c.
F.o.b. Worcester	3.40c.

*Carbon 0.25 and less.

Cold Rolled Spring Steel

		Pittsburgh and Cleveland	Worcester
Carbon	0.25-0.50%	3.20c.	3.40c.
Carbon	.51- .75	4.45c.	4.65c.
Carbon	.76-1.00	6.30c.	6.50c.
Carbon	Over 1.00	8.50c.	8.70c.

Commodity Cold Rolled Strip

No. 14, Pittsb'gh or Cleveland	3.35c.
No. 14, Worcester	3.75c.
No. 20, Pittsb'gh or Cleveland	3.75c.
No. 20, Worcester	4.15c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland)

To Manufacturing Trade

	Per Lb.
Bright wire	2.90c.
Galvanized wire	2.95c.
Spring wire	3.50c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To the Trade

	Base per Keg
Standard wire nails	$2.75
Smooth coated nails	2.75
Cut nails, carloads	3.60

	Base per 100 Lb.
Annealed fence wire	$3.15
Galvanized fence wire	3.55
Polished staples	3.45
Galvanized staples	3.70
Barbed wire, galvanized	3.40
Twisted barbless wire	3.40
Woven wire fence, base column	.75
Single loop bale ties, base col...	63

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., mill prices are $2 a ton over Pittsburgh, except for woven wire fence, which is $3 over Pittsburgh and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of $6 a ton over Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel In.	Black	Galv.	*Wrought Iron* In.	Black	Galv.
⅛	52	31	¼ & ⅜	.+13	+35
¼ to ⅜	..55	38½	½	20	1½
½	....59½	49	¾	26	8
¾	....62½	53	1 & 1¼	.30	14
1 to 3	...64½	55½	1½	34	16½
			2	....33½	16

Lap Weld

2	57	47½	2	....26½	10
2½ & 3	..60	50½	2½ to 3½	27½	12½
3½ to 6	..62	52½	4	....29½	16
7 & 8	..61	50½	4½ to 8	..28½	15
9 & 10	..60½	50	9 to 12	..24½	10
11 & 12	..59½	49			

Butt Weld, extra strong, plain ends

⅛	....50½	36½	¼ & ⅜	.+14	+48
¼ to ⅜	..52½	40½	½	21	4
½	....57½	48½	¾	27	10
¾	....61½	52½	1 to 2	..34	17½
1 to 3	63	55			

Lap Weld, extra strong, plain ends

2	55	46½	2	....29½	13½
2½ & 3	..59	50½	2½ to 4	..35	20½
3½ to 6	..62½	54	4½ to 6	..33½	19
7 & 8	..61½	51	7 & 8	..34½	19½
9 & 10	..60½	50	9 to 12	..28	15½
11 & 12	..59½	49			

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

		Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G.	$ 9.46	$ 8.41
1¼ in. o.d.	13 B.W.G.	11.21	9.96
1½ in. o.d.	13 B.W.G.	12.38	11.00
1¾ in. o.d.	13 B.W.G.	14.09	12.51
2 in. o.d.	13 B.W.G.	15.78	14.02
2¼ in. o.d.	13 B.W.G.	17.60	15.63
2¼ in. o.d.	12 B.W.G.	19.37	17.21
2½ in. o.d.	12 B.W.G.	21.22	18.85
2¾ in. o.d.	12 B.W.G.	22.49	19.98
3 in. o.d.	12 B.W.G.	23.60	20.97
4½ in. o.d.	10 B.W.G.	45.19	40.15
3½ in. o.d.	11 B.W.G.	29.79	26.47
4 in. o.d.	10 B.W.G.	36.96	32.83
5 in. o.d.	9 B.W.G.	56.71	50.38
6 in. o.d.	7 B.W.G.	87.07	77.35

Extra for less-carload quantities:

40,000 lb. or ft. or over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

CAST IRON WATER PIPE

Per Net Ton

*6-in. and larger, del'd Chicago.	$55.00
6-in. and larger, del'd New York	53.00
*6-in. and larger, Birmingham.	47.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles....	56.00
F.o.b. dock, Seattle	56.00
4-in. f.o.b. dock, San Francisco or Los Angeles	59.00
F.o.b. dock, Seattle	59.00

Class "A" and gas pipe, $3 extra
4-in. pipe is $3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $46. Birmingham, and $54 delivered Chicago and 4-in. pipe, $49, Birmingham, and $58 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:	
½ in. x 6 in. and smaller	65 and 5*
Larger and longer up to 1 in.	60 and 10*
1⅛ in. and larger	60 and 5*
Lag bolts	60 and 10*
Plow bolts, Nos. 1, 2, 3 and 7	65 and 5
Hot pressed nuts, and c.p.c and t nuts, square or hex. blank or tapped:	
½ in. and smaller	65
9/16 in. to 1 in. inclusive	60 and 5
1⅛ in. and larger	60

* Less carload lots and less than full container quantity. Less carload lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-finished hexagon nuts, U.S.S. and S.A.E.:	
½ in. and smaller	60 and 10
9/16 in. to 1 in. inclusive	60 and 5
1⅛ in. and larger	60
Stove bolts in packages, nuts attached	70
Stove bolts in packages, with nuts separate	70 and 10
Stove bolts in bulk	80

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(½-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh or Cleveland	$3.60
F.o.b. Chicago or Birmingham	3.70

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh	65 and 5
F.o.b. Cleveland	65 and 5
F.o.b. Chicago and Birmingham	65 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more.)

Per Cent Off List

Milled cap screws, 1 in. dia. and smaller	50 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75
Milled headless set screws, cut thread ¾ in. and smaller	75
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	60
Upset set screws, cup and oval points	75
Milled studs	65

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Base price, $60 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base	3.00c.
Delivered, Detroit	3.15c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
200 (½% Nickel)	$0.35
2100 (1½% Nickel)	0.75
2300 (3½% Nickel)	1.55
2500 (5% nickel)	$2.25
3100 Nickelchromium	0.70
3200 Nickel-chromium	1.35
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4600 Nickel - molybdenum (0.20 to 0.30 Mo, 1.50 to 2.00 Ni)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel-vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.60c. base per lb. Delivered Detroit, 3.75c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip	23.50c.	21.50c.
Cold-rolled strip	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	18.50c.	19c.	22.50c.	27.50c.
Plates	21.50c.	22c.	25.50c.	30.50c.
Sheets	26.50c.	29c.	32.50c.	36.50c.
Hot strip	17c.	17.50c.	23c.	28c.
Cold stp.	22c.	22.50c.	28.50c.	36.50c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

British and Continental

BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports

Ferromanganese, export	£20 Nominal
Tin plate, per base box	22s. 6d. to 23s.
Steel bars, open hearth	£11
Beams, open-hearth	£11 2s. 6d.
Channels, open-hearth	£11 7s. 6d.
Angles, open-hearth	£11 2s. 6d.
Black sheets, No. 24 gage	£14
Galvanized sheets, No. 24 gage	£16 15s.

CONTINENTAL

Per Gross Ton, Gold £, f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	£5 10s.
Steel bars, merchant	£5 5s.
Sheet bars	Nominal
Plate ¼ in. and up	£6 17s.
Plate 3/16 in. and 5 mm.	£6 13s.
Sheet, ⅛ in.	£7 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base	£5 15s.

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

	Base per Lb.
Plates	3.70c.
Structural shapes	3.70c.
Soft-steel bars and small shapes	3.80c.
Reinforcing steel bars	2.45c.
Cold-finished and screw stock:	
Rounds and hexagons	4.15c.
Squares and flats	4.15c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	4.00c.
Hoops	4.50c.
Hot-rolled annealed sheets (No 24), 10 or more bundles	4.50c.
Galv. sheets (No. 24), 10 or more bundles	5.15c.
Hot-rolled sheets (No. 10)	3.75c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$4.48
Spikes, large . . . .1 to 24 kegs	$3.65
	Per Cent Off List
Track bolts, all sizes per 100 count	55
Machine bots, 100 count	**
Carriage bolts, 100 count	**
Nuts, all styles, 100 count	**
Large rivets, base per 100 lb.	$4.35
Wire, black, soft ann'l'd, base per 100 lb.	$3.30
Wire, galv. soft, base per 100 lb.	$3.70
Common wire nails, per keg	$2.90
Cement coated nails, per keg	$2.90

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.

* Delivered in Pittsburgh switching district.

** Prices on application.

CHICAGO *Base per Lb.*

Plates and structural shapes	3.75c.
Soft steel bars, rounds	3.85c.
Soft steel bars, squares and hexagons	4.00c.
Cold-fin. steel bars:	
Rounds and hexagons	4.30c.
Flats and squares	4.30c.
Hot-rolled strip	4.10c.
Hot-rolled annealed sheets (No. 24)	4.60c.
Galv. sheets (No. 24)	5.25c.
Spikes (keg lots)	$4.40
Track bolts (keg lots)	5.05
Rivets, structural (keg lots)	**4.95
Rivets, boiler (keg lots)	**5.05
	Per Cent Off List
Machine bolts and carriage bolts, ½ in. and smaller	60
Lag screws	*55 and 5
Hot-pressed nuts, sq. and hex., tap or blank, ½ by 6 in. and smaller	60
Hex. head cap screws	60
Cut point set screws	75
Flat head bright wood screws	62 and 20
Spring cotters	45
Stove bolts in full packages	72½
Rd. hd. tank rivets, 7/16 in. and smaller	55
Wrought washers	$4.00 off list
Black ann'l'd wire per 100 lb. to mfg. trade (No. 14 and heavier)	$4.55
Com. wire nails, 15 kegs or more, per keg	$3.20
Cement c't'd nails, 15 kegs or more, per keg	$3.20

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

* These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

** Base at 100 lb.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	4.00c.
Structural shapes	3.97c.
Soft steel bars, round	4.12c.
Iron bars, Swed. charcoal	7.50 to 8.25c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	4.57c.
Flats and squares	4.57c.
Cold-rolled: strip, soft and quarter hard	3.92c.
Hoops	4.32c.
Bands	4.32c.
Hot-rolled sheets (No. 10)	4.00 to 4.07c.
Hot-rolled ann'l'd sheets (No. 24*)	4.50 to 4.75c.
Galvanized sheets (No. 24*)	5.25c.
Long terne sheets (No. 24)	5.50 to 6.20c.
Armco iron, galv. (No. 24†)	6.25c.
Toncan iron, galv. (No. 24†)	6.25c.
Galvanneal (No. 24†)	6.50c.
Armco iron, hot-rolled annealed (No. 24†)	5.65c.
Toncan iron, hot-rolled annealed (No. 24†)	5.65c.
Armco iron hot-rolled (No. 10†)	4.60c.
Toncan iron, hot-rolled (No. 10†)	4.60c.
Cold-rolled sheets (No. 20) for quantities 400 to 1499 lb.	
Standard quality	5.20c.
Deep drawing	5.85c.
Stretcher leveled	5.85c.
SAE, 2300, hot-rolled	7.82c.
SAE, 3100, hot-rolled	6.37c.
SAE, 6100, hot-rolled, annealed	10.52c.
SAE, 2300, cold-rolled	9.00c.
SAE, 3100, cold-rolled, annealed	8.55c.
Floor plate, ⅛ in. and heavier	5.60c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.65c.
Wire, galv. (No. 9)	5.00c.
Tire steel, 1 x ½ in. and larger	4.61c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, per keg in 25 keg lots	$3.25
	Per Cent Off List
Machine bolts, square head and nut: All diameters. Prices on application	
Carriage bolts, cut thread: All diameters. Prices on application	

* For 1500 lb. or more; add 0.25c. on smaller lots. No. 28 and lighter, 36 in. wide, 20c. per 100 lb. higher.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.99c.
Bars, soft steel (rounds and flats)	4.09c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	4.24c.
Cold-fin. rounds, shafting, screw stock	4.54c.
Hot-rolled annealed sheets (No. 24)	4.84c.
Galv. sheets (No. 24*)	5.49c.
Hot-rolled sheets (No. 10)	4.09c.
Black corrug. sheets (No. 24*)	4.89c.
2 galv. corrug. sheets	5.54c.
Structural rivets	5.29c.
Boiler rivets	5.39c.
	Per Cent Off List
Tank rivets, 7/16 in. and smaller	50
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, nuts; all quantities	60

* No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	3.90c.
*Structural shapes	3.90c.
*Soft steel bars, small shapes, iron bars (except bands)	4.00c.
‡Reinforc. steel bars, square and deformed	3.53c.
Cold-finished steel bars	4.53c.
*Steel hoops	4.35c.
*Steel bands, No. 12 and 3/16 in. incl.	4.10c.
*Spring steel	5.50c.
†Hot-rolled anneal. sheets (No. 24)	4.65c.
†Galvanized sheets (No. 24)	5.30c.
*Hot-rolled annealed sheets (No. 10)	4.00c.
*Diam. pat. floor plates, ¼ in.	5.25c.

These prices are for delivery in Philadelphia trucking area.

* Base prices subject to deduction on orders aggregating 4000 lb. or over.

† For 25 bundles or over.

‡ For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.86c.
Soft steel bars	3.75c.
†Reinforc. steel bars	3.50c.
‡Cold-finished steel bars	4.30c.
Hot-rolled strip, 6 in. wide and under	4.16c.
Cold-finished strip	3.60c.
Hot-rolled annealed sheets (No. 24)	4.66c.
Galvanized sheets (No. 24)	5.31c.
Hot-rolled sheets (No. 10)	3.91c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.91c.
Floor plates, 3/16 in. and heavier	5.76c.
*Black ann'l'd wire, per 100 lb.	$3.40
*No. 9 galv. wire, per 100 lb.	3.80
*Com. wire nails, base per keg	2.95
	Per Cent Off List
Machine and carriage bolts, small	65 and 5
Large	60 and 10
Nuts, 100 count ½ in. and smaller	65 and 5
9/16 in. to 1 in.	60 and 10

† Outside delivery 10c. less.

* For 5000 lb. or less.

‡ Plus switching and carriage charges and quantity differentials up to 50c.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.95c.
Floor plates	5.55c.
Bars, rounds, flats and angles	4.05c.
Other shapes	4.20c.
Rail steel reinforc. bars	3.75
Hoops and bands, 3/16 in. and lighter	4.25c.
Cold-finished bars	4.50c.
Hot-rolled annealed sheets (No. 24) 3500 lb. or more	4.60c.
Galv. sheets (No. 24) 3500 lb. or more	$5.25
Hot-rolled sheets (No. 10)	4.00c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$3.48
Com. wire nails, base per keg:	
Any quantity less than carload	3.20
Cement c't'd nails, base 100-lb. keg.	3.50
Chain. lin. per 100 lb.	8.35
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$21.80
4-in.	52.45
Lap-welded steel boiler tubes. 2-in.	20-73
4-in.	48.41

BUFFALO *Base per Lb.*

Plates	3.92c.
Floor plates	5.52c.
Struc. shapes	3.80c.
Soft steel bars	3.90c.
Reinforcing bars	3.00c.
Cold-fin. flats and sq.	4.35c.
Rounds and hex.	4.35c.
Cold-rolled strip steel	3.79c.
Hot-rolled annealed sheets (No. 24)	4.80c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	3.97c.
Galv. sheet (No. 24)	5.35c.
Bands	4.22c.
Hoops	4.22c.
Heavy hot-rolled sheets	3.97c.
Com. wire nails, base per keg	$3.26
Black wire, base per 100 lb. (2500-lb. lots or under)	4.55c.
(Over 2500 lb.)	4.45c.

BOSTON *Base per Lb.*

Channels, angles	4.20c.
Tees and zees, under 3 in.	4.45c.
H beams and shapes	4.07c.
Plates — Sheared, tank and univ. mill, ¼ thick and heavier	4.08c.
Floor plates, diamond pattern	5.13c.
Bar and bar shapes (mild steel)	4.20c.
Bands 3/16 in. thick and No. 12 ga. incl.	4.40 to 5.40
Half rounds, half ovals, ovals and bevels	5.45c.
Tire steel	5.45c.
Cold-rolled strip steel	3.845c.
Cold-finished rounds, squares and hexagons	4.65c.
Cold-finished flats	4.65c.
Blue annealed sheets, No. 10 ga.	3.90c.
One pass cold-rolled sheets No. 24 ga.	4.50c.
Galvanized steel sheets, No. 24 ga.	5.05c.
Lead coated sheets, No. 24 ga.	6.15c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

	Base per Lb.
Soft steel bars	3.94c.
Structural shapes	3.95c.
Plates	3.95c.
Floor plates	5.55c.
Hot-rolled annealed sheets (No. 24)*	4.69c.
Hot-rolled sheets (No. 10)	3.94c.
Galvanized sheets (No. 24)**	5.40c.
Bands and hoops	4.19c.
Cold-finished bars	4.30c.
Cold-rolled strip	3.78c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	6.44c.

Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot-rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 3999 lb. base; 4000 to 9999 lb., base less .10c.; 10,000 lb. and over, less .15c.

*Under 400 lb., .50c. over base, 400 to 1499 lb., base; 1500 to 3499 lb., base less .10c.; 3500 lb. and over, base less .15c.

**In Detroit only, 1500 to 3749 lb., base less 0.25c.; 3750 to 7499 lb., base less 0.40c.; 7500 lb. and over, base less 0.60c.

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.86c.
Soft steel bars, rounds up to 8 in., flats and fillet angles	3.96c.
Soft steel bars, squares and hexagons	4.11c.
Hot-rolled strip	4.21c.
Hot-rolled annealed sheets (No. 24)	4.71c.
Galvanized sheets (No. 24)	5.36c.
Cold-finished steel bars	4.41c.
Structural rivets (keg lots)	5.16c.
Boiler rivets, cone head (keg lots)	5.26c.
Track spikes (keg lots)	4.61c.
Track bolts (keg lots)	5.81c.
Black annealed wire (No. 6 to No. 9 incl.)	3.85c.
Com. wire nails and cement coated nails 100 to 4999 lb.	3.30c.

	Per Cent Off List
Machine bolts and carriage bolts, ½x6 and smaller or shorter	65
Larger and longer up to 1 in., diam.	60–5
1⅛ in. and larger	60
Coach and lag screws	60–5
Hot-pressed nuts, sq. and hex. tapped or blank, 1–199 lb.	50
200 lb. and over:	
½ in. and smaller	62½
9/16 to 1 in.	60
1⅛ in. and over	50-10

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.55c.
Hot-rolled annealed sheets, No. 24	4.85c.
Galvanized sheets, No. 24	5.50c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BIRMINGHAM

Bars and bar shapes	$3.85 base	
Structural shapes and plates	3.75	"
Hot rolled sheets No. 10 ga.	3.80	"
Hot rolled sheets No. 24 ga.	4.40	" 3500 lb. and over
Galvanized sheets No. 24 ga.	5.05	" 3500 lb. or more
Strip	4.05	"
Reinforcing bars	3.85	"
Floor plates	5.96	"
Cold finished bars	4.91	"
Machine and carriage bolts	50 & 10 off list	
Rivets (structural)	$4.60 base	

On plates, shapes, bars, hot rolled strip, heavy hot rolled sheets, the base applies on 400 to 3999 lb. All prices are f.o.b. consumer's plant.

BALTIMORE

	Base per Lb.
Mild steel bars and small shapes	4.00c.
Structural shapes	3.90c.
Reinforcing bars, 5 to 15 tons	3.16c.
Plates	3.90c.
Hot-rolled sheets, No. 10	3.95c.
Bands	4.20c.
Hoops	4.45c.
Special threading steel	4.15c.
Checkered floor plates ¼ in. and heavier	5.50c.
Galvanized sheets, No. 24, 100 bdls. or more	$4.70
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	$4.50

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets the base applies on orders 400 to 3999 lb. All prices are f.o.b. consumers' plants.

For second zone add 10c. per 100 lb. for trucking.

CHATTANOOGA

	Base per Lb.
Mild steel bars	4.21c.
Iron bars	4.21c.
Reinforcing bars	4.21c.
Reinforcing shapes	4.11c.
Plates	4.11c.
Hot-rolled sheets No. 10	4.16c.
Hot-rolled annealed sheets, No. 24*	4.06c.
Galvanized sheets No. 24*	4.66c.
Steel bands	4.41c.
Cold-finished bars	4.86c.

* Plus mill item extra.

MEMPHIS

	Base per Lb.
Mild steel bars	4.31c.
Shapes, bar size	4.31c.
Iron bars	4.31c.
Structural shapes	4.21c.
Plates	4.21c.
Hot-rolled sheets, No. 10	4.26c.
Hot-rolled annealed sheets, No. 24	4.91c.
Galvanized sheets, No. 24	5.66c.
Steel bands	4.56c.
Cold-drawn rounds	4.80c.
Cold-drawn flats, squares, hexagons	6.80c.
Structural rivets	5.15c.
Bolts and nuts, per cent off list	55
Small rivets, per cent off list	55

NEW ORLEANS

	Base per Lb.
Mild steel bars	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.35c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per keg	$3.55
Bolts and nuts, per cent off list	60

PACIFIC COAST

	Base per Lb. San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	4.05c.	4.30c.	4.25c.
Shapes, standard	4.05c.	4.30c.	4.25c.
Soft steel bars	4.20c.	4.30c.	4.45c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.975c.	2.975c.	2.975c.
Hot-rolled annealed sheets (No. 24)	5.15c.	5.05c.	5.35c.
Hot-rolled sheets (No. 10)	4.30c.	4.50c.	4.50c.
Galv. sheets (No. 24 and lighter)	5.85c.	5.25c.	5.90c.
Galv. sheets (No. 22 and heavier)	6.10c.	5.45c.	5.90c.
Cold-finished steel Rounds	6.80c.	6.85c.	7.10c.
Squares and hexagons	8.05c.	8.10c.	7.10c.
Flats	8.55c.	8.60c.	8.10c.
Common wire nails—base per keg less carolad	$3.40	$3.20	$3.40

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

	Per 1000 f.o.b. Works
First quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	$54.00
First quality, New Jersey	56.00
Select, Ohio	49.00
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	49.00
Second quality, New Jersey	51.00
No. 1, Ohio	46.00
Ground fire clay, per ton	8.00

5 per cent trade discount on fire clay brick, except for New Jersey, quoted at net price.

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$54.00
Chicago District	63.00
Birmingham	54.00
Silica cement per net ton (Eastern)	9.50

5 per cent trade discount on silica brick.

Chrome Brick

	Per Net Ton
Standard f.o.b. Baltimore, Plymouth Meeting and Chester	$49.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	49.00

Magnesite Brick

	Per Net Ton
Standard f.o.b. Baltimore and Chester	$69.00
Chemically bonded, f.o.b. Baltimore	59.00

Grain Magnesite

	Per Net Ton
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	43.00
Domestic, f.o.b. Chewelah, Wash	25.00

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	$25.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	25.00
Delivered Brooklyn	27.47
Delivered Newark or Jersey City	26.53
Delivered Philadelphia	25.84
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo, Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	24.00
F.o.b. Jackson, Ohio	25.75
Delivered Cincinnati	24.27
F.o.b. Duluth	24.50
F.o.b. Provo, Utah	22.00
Delivered, San Francisco, Los Angeles or Seattle	26.75
F.o.b. Birmingham*	20.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	$25.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	24.50
F.o.b. Buffalo	23.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	23.50
Delivered Cincinnati	24.61
Delivered Canton, Ohio	24.89
Delivered Mansfield, Ohio	25.44
F.o.b. Jackson, Ohio	25.50
F.o.b. Birmingham	19.00

Bessemer

F.o.b. Everett, Mass.	26.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	26.00
Delivered Boston Switching District	26.50
Delivered Newark or Jersey City	27.53
Delivered Philadelphia	26.76
F.o.b. Buffalo and Erie, Pa., and Duluth	25.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago	24.50
F.o.b. Birmingham	25.00
Delivered Cincinnati	25.61
Delivered Canton, Ohio	25.89
Delivered Mansfield, Ohio	26.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	$28.50

Gray Forge

Valley or Pittsburgh furnace	$23.50

Charcoal

Lake Superior furnace	$27.00
Delivered Chicago	30.24

Canadian Pig Iron

Per Gross Ton

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload)	$102.50

Spiegeleisen

Per Gross Ton Furnace

Domestic 19 to 21%	$33.00
F.o.b. New Orleans	33.00

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size

50% (carload lots, bulk)	$69.50*
50% (ton lots in 50 gal. bbl.)	80.50*
75% (carload lots, bulk)	126.00*
75% (ton lots in 50 gal. bbl.)	139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio

Per Gross Ton

10.00 to 10.50%	$33.50

For each additional 0.50% silicon up to 17%, 50c. per ton is added.

Manganese 2 to 3%, $1 per ton additional. For each unit of manganese over 3%, $1 per ton additional. Phosphorus 0.75% or over, $1 per ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50%	$27.50

For each additional 0.5% silicon up to 17%, 50c. a ton is added.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Ferrochrome

Per lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

Silico-manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon	$101.50*
2.50% carbon	106.50*
2% carbon	111.50*
1% carbon	121.50*

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads, nominally	$2.00
Ferrotungsten, lots of 500 lbs., nominally	2.05
Ferrotungsten, smaller lots, nominally	2.10
Ferrovanadium, contract, per lb. contained V., delivered	$2.70 to $2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots.	$2.25†
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	$142.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	$157.50
Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, $3 unitage, freight equalized with Nashville	$75.00
Ferromolybdenum, per lb. Mo. f.o.b. furnace	95c.
Calcium molybdate, per lb. Mo. f.o.b. furnace	80c.

*Spot prices are $5 per ton higher.
†Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	$5.25
Old range, non-Bessemer, 51.50%	5.10
Mesabi, Bessemer, 51.50%	5.10
Mesabi, non-Bessemer, 51.50%	4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria, nominal	17.00c.
Iron, low phos., Swedish, average, 68½% iron Nominally 17 to	18c.
Iron, basic or foundry, Swedish, aver. 65% iron. Nominally	16c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	50c.
Man., African, Indian, 44-48%	45c.
Man., African, Indian, 49-51%	Nominal
Man., Brazilian, 46 to 48½%	Nominal

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered	$23.50 to $25.00
Tungsten, domestic, scheelite delivered	$20.00 to $25.00

Chrome ore (lump) c.i.f. Atlantic Seaboard, per gross ton:

South African (low grade)	$16.00
Rhodesian, 45%	22.00
Rhodesian, 48%	25.50
Turkish, 48-49%	25.00 to $26.00
Turkish, 45-46%	23.50 to 24.00
Turkish, 44%	19.00 to 19.50

Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton:

50%	$25.50 to $26.50
48-49%	25.50 to 26.00

FLUORSPAR

Per Net Ton

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	$18.00 to $19.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	20.00
Foreign, 85% calcium, fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	31.50

FUEL OIL

Per Gal.

F.o.b. Bayonne or Baltimore, No. 3 distillate	5.25c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	5.25c.
Del'd Ch'go, No. 3 industrial	4.15c.
Del'd Ch'go, No. 5 industrial	4.00c.
Del'd Cleve'd, No. 3 distillate	5.75c.
Del'd Cleve'd, No. 4 industrial	5.625c.
Del'd Cleve'd, No. 5 industrial	4.00c.

COKE

Per Net Ton

Furnace, f.o.b. Connellsville, Prompt	$4.00 to $4.25
Furnace, f.o.b. Connellsville, Prompt	5.00 to 6.25
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by-product, Philadelphia	10.95
Foundry, by-product, delivered Cleveland	11.05
Foundry, by-product, delivered Cincinnati	10.50
Foundry, Birmingham	7.50
Foundry, by-product, del'd St. Louis industrial district	11.00 to 11.50
Foundry, from Birmingham, f.o.b. cars dock, Pacific ports	14.75

THIS WEEK'S MACHINE . . .TOOL ACTIVITIES. . .

. . . Automotive plants expected to release large orders in the near future.

o o o

. . . Inquiries continue brisk, but orders are in light volume from general industry.

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. . . Backlogs continue to dwindle, despite foreign sales.

Machinery Trade Expecting Big Automotive Orders Soon

DETROIT—Marking time without explanation, the machine tool industry in Detroit expects momentarily a break in the dam that has held off action on the many inquiries which they now have on hand. In each case automobile plant representatives declare that they need only final engineering release on parts before the flood will be loosed. While the delivery situation is clear now, machinery company representatives and local manufacturing concerns regard it as necessary that considerable work be placed before the middle of March if an acute situation is to be avoided at the time when new cars are scheduled to go into production. One body builder is reported to have tentative arrangements with die shops which would practically put many of them under contract for the rest of the season to handle the gigantic program which is to be launched by the automobile companies using this type body.

Northern Ohio Builders Wait For Automotive Programs

CLEVELAND—With domestic machine tool inquiries lacking volume, most interest in this district is centered upon the automotive industry in Michigan where a number of manufacturers are reported making preliminary preparations toward their programs for 1939 models. Current orders for tools from Detroit are very light, and in a number of instances parts makers considering buying new equipment have been cautioned by Detroit officials to take their time. Ford, Briggs, Fisher Body and Buick are among those understood to be most actively considering 1939 programs. Ford orders for presses and other equipment have been limited, but more numerous than those from some of the other automotive firms. In regard to Ford's program for replacing 30 or more lathes, mentioned here last week, it is now understood that the company has decided to purchase one lathe from each of six or eight makers and conduct a short series of tests before making final allotments, possibly in the latter part of April.

Refrigerator manufacturers usually buy tools about this time of year, but so far this quarter have been quiet. However, the lathes, grinders, drilling and miscellaneous equipment required for the new Norge plant at Muskegon, Mich., will probably be placed in the near future. The General Electric Co. at Fort Wayne, Ind., bought a few tools not long ago. Foreign machine tool inquiry has become lighter recently. Two or three machines were purchased in this country recently for the Canadian armament program.

Backlogs of Cincinnati Builders Dwindling; Inquiries Brisk

CINCINNATI—New machinery business, in this area, is off a shade from previous levels with a dependency on foreign demand to sustain the present market. A few domestic users are currently reported in the market with one or two unit orders for lathes, shapers, millers and grinders. The more active interest, however, is from foreign sources, particularly the Near East. Drilling machinery is almost at a standstill with virtually no orders, but planers and boring mills are displaying fair activity. Market tone, however, is still good as manufacturers indicate strong opinion of early revival. This feeling is largely based upon the present brisk inquiry. Users have no hesitancy in requesting quotations and hope of some closing on these figures is high.

Production was steady, the past week, at 40 per cent, but with backlogs rapidly dwindling a reduction is imminent.

Little Change in Activity In The Middle West

CHICAGO—Activity is little changed in this market, demand for both small and machine tools riding along at about the level of the past few weeks. Some sellers are of the opinion that machine tool interest is slightly lower currently, but little significance is seen in this expression, as the same dealers state that several buyers have given indication that some good orders are not far distant. Actual tangible inquiries are few, the outstanding this week being an additional list from the Santa Fe, which includes a drill grinder, a flat and a universal turret lathe, and an engine lathe, destination to be the San Bernardino shops. No action has yet been taken on the large list issued two weeks ago by the Milwaukee, and further delays are being encountered on the International Harvester buying of tools for its contemplated small tractor.

Metropolitan Orders Reached A Low At Month End

NEW YORK—While there was some activity in machine tool sales at mid-month, by last week new business had dropped to a mere trickle of miscellaneous small orders, mostly for accessories. There were exceptions, of course, one of them being the purchase of three turret lathes by a small aircraft engine parts manufacturer in Long Island. One of the leading engine builders has also been in the market during the past month. Most dealers and factory representatives did a less volume of business than in January. Prospects for March business are still bright, however, as there has been no let-up in inquiries, which have been running high in volume in recent weeks. These domestic inquiries are coming from a wide diversity of industry as well as from service units of the Government and those that have Army and Navy orders. The Bendix development in New Jersey is moving along, but indications are that there will be no machinery buying until the buildings are completely erected within the next two months.

There is a steady flow of Russian inquiries and orders, but the demand from England has fallen off sharply since the first of the year.

Sales Drag, Inquiries Improve At Pittsburgh

PITTSBURGH—A moderate improvement in the volume of inquiries during the past week is indicated, but sales are no better than a few weeks ago. Business during the early part of February came in at a faster rate than in the last half of the month with the result that total February business will be greater than in January. The better activity noted in inquiries may presage an improved volume of orders in March, but there is still a note of caution among all buyers of machine tools. George H. Bucher, newly elected president, Westinghouse Electric & Mfg. Co., East Pittsburgh, recently declared that prospects of a moderate business improvement over the next few months is indicated. His optimism, he said, was based in part on inquiries for equipment and on the slight improvement in new business during the past few weeks.

Navy Wants 78-82% Ferromanganese

WASHINGTON.—In THE IRON AGE of Feb. 24, page 76, it was stated that the Navy Department was asking for bids on "78-92" per cent ferromanganese. In referring to the manganese content of course the figures should have read 78-82 per cent.

A MAGNETIC CHUCK THAT'S DIFFERENT!

NO WIRES . . .
NO HEATING . . .
NO RUNNING COSTS

Brown & Sharpe Magnetic Chucks, Permanent Magnet Type —

have the advantages of electromagnetic chucks, but do not require any electric current — electrical connections, wires, switches and auxiliary generators are all eliminated. The chucks have long life and full holding power and do not heat under any conditions. Ask for circular. Brown & Sharpe Mfg. Co., Providence, R. I., U. S. A.

B·S

BROWN & SHARPE

PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

Johns-Manville Corp., 22 East Fortieth Street, New York, manufacturer of building materials, pipe, etc., has let general contract to Hughes-Foulkrod Co., Schaff Building, Philadelphia, for extensions and improvements in conduit-manufacturing works at Richmond, Ind. Cost about $75,000 with equipment. Francisco & Jacobus, 511 Fifth Avenue, New York, are consulting engineers.

Hygrade Food Products Corp., 30 Church Street, New York, canner and packer of food products, has leased a two-story and basement building at 51-53 Central Avenue, Passaic, N. J., and will improve for new branch meat-packing plant. Cost over $50,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 8 for 117 steam pressure gages, 50 hydrogen and oxygen pressure gages and 150 oil pressure gages for Brooklyn Navy Yard (Schedule 2893).

Consolidated Edison Co. of New York, Inc., 4 Irving Place, New York, has filed plans for extensions and improvements in seven-story steam-electric generating station at 320-26 West 201st Street. Cost about $250,000 with equipment. T. R. Galloway is company engineer.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until March 16 for 15,267 ft. of cable and 17 reels (Circular 132), 10,500 flashlights (Circular 133); until March 21 for couplings and plugs (Circular 136).

Beacon Packing Co., Brooklyn, manufacturer of food products, has leased a four-story building at 242 South First Street, for new plant.

Refined Syrups, Inc., 120 Wall Street, New York, will have plans drawn by J. W. Stafford, engineer for Suchar Process Corp., same address, with which first noted company is associated, for modernization and improvements in part of former refinery of Spreckels Sugar Corp., Yonkers, N. Y., recently acquired for a new plant. Cost about $750,000 with equipment.

Quartermaster, West Point, N. Y., asks bids until March 8 for 430 steel lockers (Circular 955-68).

Super Cold New York Co., Inc., 32-27 Queens Boulevard, Long Island City, New York, manufacturer of refrigerating equipment and parts, has leased a one-story building at 43-24 Thirty-seventh Street, about 10,000 sq. ft. of floor space, for expansion in storage and distributing division.

S. B. Penick & Co., 132 Nassau Street, New York, manufacturers of industrial and other chemicals, have let general contract to Mark C. Tredennick Sons, 103 Park Avenue, for modernization in former plant of United Cork Companies, Inc., Lyndhurst, N. J., recently acquired, totaling about 75,000 sq. ft. of floor space, to be equipped for new plant.

Refractory Products, Inc., Newark, N. J., manufacturer of foundry specialties, has leased space in one-story building at 500 Chancellor Avenue, Irvington, N. J., for plant. N. J. Moore is president.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until March 8 for reworking 600,000 lb. of brass scrap into 600,000 lb. of cartridge brass cups, and reworking other scrap brass into 425,000 lb. of similar cartridge brass cups (Circular 722), reworking 475,000 lb. of gilding metal clippings, scrap and cartridge brass scrap into gilding metal, and for reworking scrap copper, gilding metal scrap, etc., into 165,000 lb. of gilding metal (Circular 723).

International Staple & Machine Co., Philadelphia, manufacturer of stapling machines, etc., has leased a floor in building at 116-20 North Seventh Street for plant.

Quartermaster, Fort Jay, Governors Island, New York, asks bids until March 7 for 1, 1½ and 2-in. galvanized wrought iron pipe (Circular 429-24).

BUFFALO DISTRICT

National Gypsum Co., 190 Delaware Avenue, Buffalo, has arranged for purchase of Best Brothers Keene's Cement Co., Medicine Lodge, Kan., manufacturer of cement, gypsum products, etc., and will consolidate. Acquired company has main mill at place noted, and over 2000 acres of gypsum lands near Sun City, Kan. Properties will be continued by purchasing company and expansion in production carried out.

United States Engineer Office, Federal Building, Buffalo, asks bids until March 7 for one marine-type oil burner, single stage, steam turbine drive (Circular 119).

Carborundum Co., Niagara Falls, N. Y., manufacturer of abrasive materials, etc., plans new compressor plant, with installation of air compressor units and accessory equipment.

NEW ENGLAND

Armstrong Rubber Co., West Haven, Conn., manufacturer of automobile tires, tubes, etc., has arranged with city officials at Natchez, Miss., for immediate erection of local plant, to be owned by municipality and occupied under long-term lease. It will include power house, machine shop and other mechanical departments. City has arranged a bond issue of $300,000 for purchase of site and plant construction. Production will be given over to tires for Sears, Roebuck & Co., Chicago, who will be active in project, including equipment installation. Cost close to $1,500,000 with machinery.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until March 7 for 300 steel stacking tote boxes, 7⅞ x 14½ x 22¼-in. (Circular 152).

William H. Gammon, Lewiston, Me., manufacturer of show cases, cabinets, etc., plans rebuilding part of plant recently destroyed by fire. Loss close to $200,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 11 for motor-generators, controllers and spare parts (Schedule 2881); until March 15, rough machined steel forgings (Schedule 2921) for Boston, Charleston and Puget Sound yards; steel forgings (Schedule 2901), nickel-copper-alloy forgings (Schedule 2909) for Newport, R. I., Naval Station.

WASHINGTON DIST.

United States Coast Guard Headquarters, Washington, asks bids until March 7 for one to 10 3-kw. diesel engine-generating sets for period ending June 30 (Proposal CG-3432).

Campbell Metal Window Corp., Bush and Hamburg Streets, Baltimore, has let general contract to Davis Construction Co., 9 West Chase Street, for one-story addition, 50 x 170 ft., primarily for storage and distribution. Cost close to $40,000 with equipment.

General Purchasing Officer, Panama Canal, Washington, asks bids until March 11 for one automatic electric plant, one air compressor, one ceiling type blower, two propeller fans, 10 7½-kw. unit heaters, railing fittings for ice cream and milk-bottling plant, and other equipment (Schedule 3335).

City Council, South Norfolk, Va., has plans for new municipal electric power plant. Cost about $381,000 with engine-generator units and auxiliary equipment. Financing is being arranged through Federal grant and loan. Wiley & Wilson Peoples' National Bank Building, Lynchburg, Va., are consulting engineers.

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until March 7 for two sets of cast steel tender truck side frames and equipment necessary to convert tender trucks from arch bar type to meet A.A.R. standard (Circular 398-105); until March 22, one boiler feed steam pump (Circular 398-106).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 8 for 20,000 band saw blades (Schedule 2913) for Washington yard; one 400-hp. electric dynamometer and one set of controls (Schedule 2931) for Annapolis Navy Yard; circuit breakers (Schedule 2878); until March 15, pressure relief valves (Schedule 2925) for Portsmouth Navy Yard; 3000 cylinder valves (Schedule 2889) for Norfolk and Mare Island yards; 60,000 sq. ft. of copper wire cloth, 42-in. wide (Schedule 2916), pressure lubricating gun fittings (Schedule 2923), powder and cartridge tanks (Schedule 2882) for Eastern and Western yards; boiler-water testing outfits and spare parts (Schedule 2896) for Sewall's Point and Mare Island yards.

SOUTH CENTRAL

Breaux Bridge Sugar Cooperative, Inc., Breaux Bridge, La., Robert L. Angello, president, recently organized, plans new cane sugar mill on local site comprising several one and multi-story units, with tank house, power station, pumping plant and other mechanical departments. Cost over $200,000 with equipment.

United States Engineer Office, First District, New Orleans, asks bids until March 15 for two cast steel volutes, two cast steel back heads for 20-in. dredging pump, two cast steel impellers, two forgings for impeller shafts, two cast steel distributing Y's, four cast steel elbows, two cast steel cone liners, two steel plate back-head liners, two steel plate impeller liners, two steel plate connection liners, 1680 lb. cast steel sheaves, 360 lb. cast steel jaws, and 312 lb. cast steel crosses (Circular 222).

Town Council, Lenoir City, Tenn., asks bids until March 12 for a municipal electrical distributing system, with transmission line connection for TVA power supply. Cost about $49,000. Financing has been arranged through Federal aid. Campbell Wallace, Empire Building, Knoxville, Tenn., is consulting engineer.

Fred I. Getty Mfg. Co., Jennings, La., manufacturer of oil well equipment and supplies, has awarded structural steel contract to E. B. Ludwig Co., 7919 Spruce Street, New Orleans, for rebuilding plant recently destroyed by fire, consisting of two main one-story units, 50 x 180 ft., and 50 x 120 ft. An office building will be built later. Cost close to $100,000 with equipment.

SOUTH ATLANTIC

Water Board, Macon, Ga., C. T. Williams, chairman, asks bids until March 8 for one 200,000-gal. steel standpipe, cylinder 26 ft. in diameter, and overall height of 60 ft., for municipal water department.

Greenwood County Finance Board, Greenwood, S. C., E. L. Brooks, chairman, has extended closing date from March 14 to March 22 for power dam, power house, spillway and other structures for hydroelectric power project at Buzzard Roost. Bids for equipment will be asked later. Cost over $1,200,000. D. T. Duncan Engineering Co., Greenwood, is consulting engineer.

Georgia Power Co., Atlanta, Ga., has authorized appropriation of $4,798,000 for expansion and improvements in power plants and system, $3,400,000 to be used for exten-

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sions in rural and other electrical distributing lines, and $793,000 for power transmission lines in different districts.

SOUTHWEST

Barry-Wehmiller Machinery Co., 4660 West Florissant Avenue, St. Louis, manufacturer of bottle-washing machinery and parts, etc., has let general contract to A. H. Haeseler Building & Contracting Co., 2346 Palm Street, for one-story addition, 59 x 100 ft. Cost about $45,000 with equipment. Gale Henderson, Wainwright Building, is architect; W. J. Knight & Co., last noted address, are consulting engineers.

Blanton Co., 318 South Second Street, St. Louis, plans rebuilding vegetable oil mill at Helena, Ark., operated under name of New South Oil Mill, recently destroyed by fire. Loss close to $175,000 including equipment.

Board of City Commissioners, Kansas City, Kan., has plans for municipal bulk food terminal on Kaw River, Public Levee district, comprising a group of buildings, two-story and basement, 100 x 484 ft., one and two-story and basement, 100 x 484 ft., one-story, 100 x 340 ft., and two adjoining one-story units; railroad terminal facilities will be provided. Entire project will cost $4,250,000 including conveying, loading, elevating and other mechanical-handling equipment. Financing is being arranged through Federal aid. Alonzo H. Gentry, Voskamp & Neville, Inc., 4 West Thirteenth Street, Kansas City, Mo., are architects; Joseph W. Radotinsky, Commercial National Bank Building, Kansas City, Kan., and Walter F. Schulz, Memphis, Tenn., are associate architects.

Missouri-Pacific Railroad Co., St. Louis, plans addition to engine house and shops at Ewing and Chouteau Avenues, with installation of additional equipment. Cost about $103,000. Appropriation has been authorized. S. L. Wonson is chief engineer.

Mammoth Producing & Refining Co., Corpus Christi, Tex., plans new oil refinery, comprising several one and multi-story units with steel tank storage facilities, boiler house, pumping station and other divisions. Cost close to $250,000 with equipment.

WESTERN PA. DIST.

Pennsylvania Power Co., Youngstown, Ohio, has let general contract to J. A. Utley, 6031 Mansur Street, Detroit, for one and two-story operating, service and equipment building at New Castle, Pa., 130 x 355 ft., with repair and garage facilities for company motor trucks and cars. Cost close to $170,000 with equipment.

Gamble Dimension Sales Co., 4600 Louisville Avenue, Louisville, will take bids soon on general contract for new electric-operated dimension lumber mill at Tygart Valley Homesteads, about 11 miles from Elkins, W. Va., where arrangements have been made with Kenwood Corp., for new plant. It will include power house, machine shops and other structures, totaling about 50,000 sq. ft. of floor space. Cost about $250,000 with machinery. Considerable part of fund will be financed through Federal aid, in cooperation with Farm Security Administration, which is sponsoring project. E. T. Hutchings, Heyburn Building, Louisville, is architect. C. D. Dosker is president of first noted company.

MICHIGAN DISTRICT

Pfeiffer Brewing Co., 3700 Beaufait Avenue, Detroit, has let general contract to Alfred A. Smith, Penobscot Building, for two-story addition for storage and distribution. Cost over $50,000 with mechanical-handling and other equipment. Company recently made award to same contractor for a four-story and basement addition to cost about $400,000 with equipment. Harley & Ellington, Inc., Stroh Building, is architect and engineer.

Michigan Fruit Canners, Inc., South Haven, Mich., has asked bids on general contract for one-story addition for expansion in canning and packing division, storage and distributing department, also improvements in present plant. Cost close to $45,000 with equipment. M. C. Billingham, Kalamazoo, Mich., is architect.

Consumers Power Co., Jackson, Mich., has asked bids on general contract for addition to electric generating plant at Kalamazoo, Mich. Cost about $300,000 with machinery.

City Pattern Works, 1161 Harper Street, Detroit, manufacturer of mechanical patterns, is considering new plant on Oakland Avenue, Highland Park, comprising three one-story units. Cost over $50,000 with equipment.

OHIO AND INDIANA

Crowell Publishing Co., High Street, Springfield, Ohio, has engaged Ford, Bacon & Davis, Inc., 39 Broadway, New York, consulting engineer, to prepare plans for multi-story addition to printing and publishing plant, with section for storage and distribution. Cost about $1,000,000 with equipment.

Taylor-Young Airplane Co., Alliance, Ohio, airplanes and parts, will take bids soon on general contract for one-story addition. Cost about $45,000 with equipment.

Nehi Bottling Co., Ravenna, Ohio, has let general contract to C. B. Lykens, Ravenna, for one-story mechanical-bottling plant. Cost about $40,000 with equipment.

Contracting Officer, Materiel Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until March 7 for three motor-drive units (Circular 722), about 73,500 copper soldering lug electrical terminals (Circular 727); until March 8, 160 10-ton hydraulic jacks (Circular 753), drive screws and sheet metal screws (Circular 735), 2200 fuel and oil hose elbows (Circular 730); until March 9, aluminum alloy rivets, copper rivets, iron rivets, washers and lock washers (Circular 736); until March 10, one bombing trainer target assembly and one control board assembly (Circular 741), 9000 radiator core tubes, one radiator core section of about 25 sq. ft. frontal area (Circular 738), 228 hose assemblies, 41 in. long, and 262 hose assemblies, 55 in. long; until Mach 11, 5625 propeller nuts (Circular 744); until March 15, 2000 spring tension gages (Circular 758), one portable electric welder (Circular 755).

Metals Products Co., 1305 East Washington Boulevard, Fort Wayne, Ind., manufacturer of underground oil and gasoline tanks, etc., has acquired one-story building at 1617 South Calhoun Street, and will modernize for new plant. A one-story addition will be built, 60 x 120 ft. Cost close to $45,000 with equipment.

MIDDLE WEST

Jordan Co., 2630 West Arthington Street, Chicago, manufacturer of acids and other industrial chemicals, has acquired about 12 acre tract at Clarendon Hills, Du Page County, for new plant, comprising 12 one-story units, with power house, machine shop, pumping station and other structures. Cost about $350,000 with equipment. N. Ronneberg, Inc., 10 South La Salle Street, Chicago, is architect and engineer.

Quartermaster, Chanute Field, Rantoul, Ill., asks bids until March 7 for cross arm braces, armored steel cable, rigid steel conduit, locknuts, panel boards, copper insulated wire, galvanized pipe straps, malleable iron galvanized conduit bushings and other equipment (Circular 196-45).

Gold Seal Liquors, Inc., 424 South Wells Street, Chicago, has acquired a five-story and basement building at West Harrison and Desplaines Streets, for new storage and distributing plant.

United States Engineer Office, Post Office Building, Chicago, asks bids until March 21 for construction of an oil storage building at Joliet Moorings, Illinois Waterway (Circular 93).

Village Council, Westbrook, Minn., is arranging bond issue of $78,200 for new municipal electric power plant, using diesel engine-generator units and auxiliary equipment. Buell & Winter Engineering Co., Insurance Exchange Building, Sioux City, Iowa, is consulting engineer.

Purchasing and Contracting Officer, CCC Camp, Sparta, Wis., asks bids until March 7 for band saw blades, circular saw blades, woodworkers' bandsaws, woodworkers' jointers and other equipment (Circular 601-64).

Northern Paper Mills, Green Bay, Wis., has placed order for turbines with General Electric Co., and boilers with Riley Stoker Co., for new steam generating plant to cost $750,000 or more. Bids on boiler house and turbine room construction will be asked about April 1. H. W. Gochnauer is chief engineer, and Sargent & Lundy, Inc., 104 South Dearborn Street, Chicago, consulting engineer.

Park Welding & Boiler Repair Co., 1828 North Third Street, has opened a general welding and service shop at 710 West National Avenue.

PACIFIC COAST

San Francisco Bay Exposition, 585 Bush Street, San Francisco, L. W. Cutler, president, plans railroad freight terminal at Yerba Buena Shoals, comprising main one-story building, 150 x 450 ft., with mechanical-handling, conveying, loading and other equipment. Yard will be provided with heavy-duty diesel-type locomotive. Cost over $500,000 with trackage and other facilities. San Francisco Bay Exposition Architectural Commission, first noted address, is architect and engineer.

Ventura Junior College District, Ventura, Cal., plans one-story mechanical arts building. Cost about $66,000 with equipment. Work will be carried out in connection with other buildings at institution, entire project to cost about $600,000. Roy C. Wilson and Geoffry N. Lawford, Say Road, Santa Paula, Cal., are architects.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 15 for one motor-driven keyway cutter (Schedule 2915), eight 60-gal. steam-jacketed kettles (Schedule 2905), two redistillation plants and spare parts (Schedule 2920), for Mare Island Navy Yard; one motor-driven horizontal boring, milling and drilling machine (Schedule 2908) for Puget Sound yard.

Southern Pacific Railway Co., Union Station, Portland, has filed plans for one-story machine shop, 60 x 90 ft., at 1835 S.E. Holgate Boulevard. Cost about $25,000 with equipment.

Purchasing Agent, Alaska Railroad, Federal Office Building, Seattle, asks bids until March 7 for one motor-driven centrifugal circulating pump, one closed-type feed-water heater, one duplex vacuum pump and three boiler-feed pumps (Proposal 02730).

Supply Officer, Puget Sound Navy Yard, Bremerton, Wash., asks bids until March 10 for steel machine bolts (Req. 9/22992 S. & A.), one double head siren, horizontal type, motor-driven (Req. 18-NSA).

Bureau of Reclamation, Denver, asks bids until March 16 for trash rack metal work for 10 outlet-works trash rack structures, 18 main-unit penstock trash rack structures, and three station-service penstock trash rack structures for Grand Coulee Dam, Grand Coulee, Wash. (Specifications 777).

FOREIGN

Government of Mexico, Mexico, D.F., has signed contract with James Stewart & Co., 230 Park Avenue, New York, general contractors, to act as its official purchasing agent in United States for machinery and equipment for railroad construction and development, for petroleum plants and developments, and mechanical equipment for other purposes. The agreement is said to stipulate that purchases by Government will not exceed $10,000,000 in any one year through the company.

Bulldog Batteries, Ltd., Sydney, New South Wales, Australia, electric storage batteries and parts, plans new works at Launceston, Tasmania. Cost over $350,000 with equipment. A subsidiary company is being formed with capital of £250,000 ($1,250,000) to carry out project. W. M. McDuff is manager of first noted company.